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HOLDING ON TO HANDHELDS

How to keep these wandering devices secure now that they're holding vital corporate data (page 48). And which should you pick: Palm or Pocket PC? Our editors duke it out (page 74).

RE-ENGINEERING REDUX

Jim Champy, who helped formulate the idea of re-engineering in 1992, now claims that the New Economy won't work without it. Page 47

COMPUTERWORLD

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SOME SITES MEET PRIVACY DEADLINE

Compliance costly in move to protect kids

BY DEWAYNE LEHMAN

Web developers and operators at sites catering to kids got the full flavor of Internet regulation last week when they scrambled to meet the April 21 deadline to comply with the nation's first law governing online privacy. And some sites probably didn't make it, risking stiff fines.

The Children's Online Privacy Protection Act mandates that Web sites that either target children under the age of 13 or collect personal information from them have a privacy policy posted that spells out what information they collect as well as parental notification and consent systems.

Looking Out For Kiddie Surfers

The Children's Online Privacy Protection Act:

- Was passed in 1998, making it the first law to regulate Internet privacy
- Applies to Web sites that are aimed at children or that knowingly collect information from them
- Requires sites to get parental consent before collecting information from a child under 13
- Stipulates that sites post notice of what data is collected from children and how it's used
- States that parents must have access to information collected

"What we're learning is that a lot of sites aren't in compliance," said Parry Aftab, a partner at Springfield, N.J.-based

Privacy, page 97

AMAZON OPENS BOOK ON WEB SITE

Peek behind scenes reveals how retailer scaled hardware during dramatic growth

BY CAROL SLIWA
CHICAGO

WEB STRATEGY

The world's largest online bookseller once protected its precious database servers from a leaky Seattle roof with a piece of blue tarpaulin that a staffer rushed out to buy at Home Depot.

Amazon.com Inc. has come a long way since attaching that tarp to the fourth-floor ceiling of its downtown Seattle nerve center two years ago. Today, the retailer is building a second data center in Virginia that will have four times the capacity of its current one, Kim Rachmeler, director of enterprise management, told a Retail Systems 2000 audience here last week.

Amazon is typically tight-lipped about its information technology. So Rachmeler's speech provided a rare glimpse into the behind-the-scenes technical challenges, and sometimes dramatic solutions, that staffers devised on frenetic Internet time to cope with traffic levels that grew 30% each month during the company's first 18 months in business.

"Survival is absolutely the same thing as scaling for us," Rachmeler said. "Scaling is the most important thing we do. It is our No. 1 strategic initiative."

And it has been driving Amazon's Web architecture decisions. As traffic soared the first few years, Amazon opted for bigger and bigger boxes because it had the money but not the time or the staff to optimize systems, Rachmeler said.

When Amazon opened shop in July 1995, IT staffers set up a bell to ring every time a book

Amazon, page 16

MICROSOFT BLAMES SLOWER PC SALES

Gloomy projections alarm analysts

BY DOMINIQUE DECKMYN AND LINDA ROSENCRANCE

A Microsoft Corp. official, ending an unusually dour earnings call late last week, predicted lower future growth and blamed it partly on soft sales of corporate PCs. That set off a chorus of concerns about the impact it would have on the stock market, which reopens today for the first time since Thursday.

During the conference call with journalists and analysts, Chief Financial Officer John Connors said lower-than-expected sales of business PCs had hurt revenue for the quarter ended March 31. Uncertainty about further business PC growth and the maturity of Microsoft's main product lines, he said, would put percentage revenue growth in the "mid-teens" for the fiscal year starting July 1. That report alarmed some analysts, who had expected up to 20% growth.

Microsoft, page 16

THE TROOPS ARE GRUMBLING

ERIKA MULLER, a network engineer, says she recently left a company whose managers never gave her any guidance

GREG KINCH

OUR ANNUAL Job Satisfaction Survey found more than half of the IT working class complaining about clueless bosses, aimless jobs and skimpy bonuses. And a majority of respondents said stress levels are rising. But Kathleen Melymuka reports that the survey has another message: The happy IT professionals are the ones who get challenging assignments and the opportunity to learn new skills.

Report begins on page 54.

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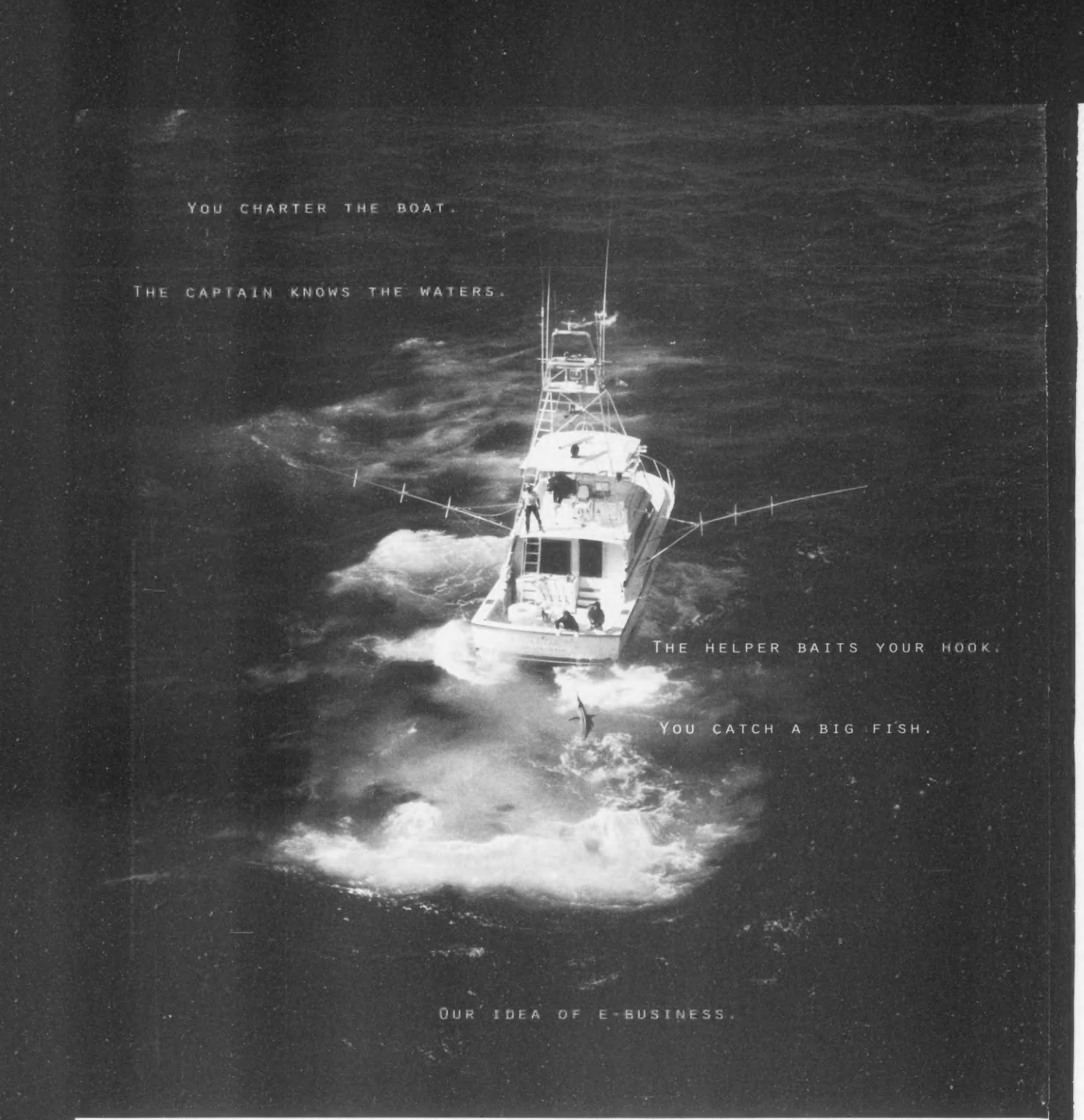

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DESCENDING FROM THE THRONE

During CIO Dennis Jones' tenure at FedEx Corp., the company became the first in the shipping industry to offer customers online package tracking, and it redefined itself as a supply-chain management company. Now, after 25 years, Jones plans to retire. Page 42

ERP DELIVERS

CIO Tim Monteith is counting on a new ERP system to enable Domino's Pizza to distribute supplies to 4,500 stores, served by 18 regional distribution centers nationwide. Supply-chain management is "a hot area" best served when an IT pro gets experience on the ground floor of an installation. Page 82

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QUICKSTUDY

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78 **BUYERTOUCH ADDS** the human touch to gathering and analyzing e-commerce Web site statistics.

> . . . any 15-year-old with a Windows 98 computer can take down Yahoo. It's scary.
>
> CHRIS DAVIS, CEO OF HEXEDIT NETWORK SECURITY INC. IN OTTAWA.
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98 **FRANK HAYES** isn't done talking about the IT skills gap. He offers six pieces of advice for job seekers.

AT DEADLINE

System Problems Spur Investigation

The regulatory arm of the National Association of Securities Dealers (NASD) is investigating Banc One Capital Markets Inc. for possible violations resulting from systems integration problems that surfaced from the 1998 merger of Banc One Corp. in Columbus, Ohio, and First Chicago NBD Corp.

Details weren't available because NASD offices were closed Friday. But the Chicago-based bank issued a statement that said the "bookkeeping problems resulted from the systems conversion in our capital markets units and their consolidation in 1999."

Intel Delays Desktop Celeron Launch

Intel Corp. is delaying its planned launch of two desktop Celeron chips today until June, sources close to the company said last week. Intel delayed the 633- and 667-MHz chips to ensure that a sufficient quantity will be available upon release, sources said.

Maryland Likely To Adopt UCITA

Maryland Gov. Parris N. Glendening is expected to sign into law tomorrow the controversial Uniform Computer Information Transactions Act (UCITA). Although Maryland is the second state to approve UCITA, the governor's office said it will be the first state to legally enact the measure. Virginia approved UCITA last month but delayed implementation for a year pending review by a study committee. The software licensing bill has strong support among high-tech vendors but is opposed by many CIOs at user companies.

Short Takes

SUN MICROSYSTEMS INC. last week announced that 13 vendors have licensed its Java 2 Platform Enterprise Edition. . . . Boston-based ORBISCOM, a provider of global Internet payment software, announced a new online payment technology designed to battle online card fraud.

More Firms Seek Overseas Labor

Skills shortage, need to expedite Web projects drive increase in 'offshoring'

BY JULEKHA DASH

WHEN Internet services firm SeraNova Inc. two months ago suggested that auction site LiquidPrice.com Inc. move some of its Web development to SeraNova's offshore operations, Piyush Gupta, LiquidPrice.com's founder, president and CEO, was skeptical.

Formerly head of software development at database company Informix Corp. in Menlo Park, Calif., and a self-described "control freak," Gupta's motto was, "You don't let development out of the house." But he was eventually swayed by the cost savings: The same project in the U.S. would cost almost three times as much as overseas. And soon he was armed with a strategy to make offshore outsourcing work without giving up control.

Cupertino, Calif.-based LiquidPrice.com isn't the only company farming some of its technology work overseas. Although companies have capitalized on "offshoring's" time and cost savings for years, analysts and labor experts said the practice has accelerated in the past six months. Efforts to expedite Web projects and the depletion of H-1B visas are forcing firms to seek alternative labor sources.

In the past six months, MaryLu Cianciolo, an immigration attorney in Chicago, heard more than 50 employers express interest in offshoring as the quota for H-1B visas approached its cap. (The U.S. Immigration and Naturalization Service stopped taking new petitions March 21.)

But a provision to a proposed H-1B visa bill could significantly alter some employers' approaches to offshoring, Cianciolo warned.

Many companies have bypassed the H-1B cap by establishing foreign offices. U.S. employers can bring foreign workers, who are the company's employees in those offices, to the U.S. on a transfer visa rather than the H-1B. But employers will no longer be able to go that route if a bill introduced two weeks ago by U.S. Rep. Lamar Smith (R-Texas) is passed. While the bill proposes to remove the H-1B visa cap, it also includes a provision that would force employers to "keep those individuals overseas unless they qualify for an H-1B," said Cianciolo.

Although companies have traditionally relied on offshore talent to perform application development and maintenance work, they are now farming out more sophisticated Internet services, said Cynthia Doyle, a senior analyst at International Data Corp. in Framingham, Mass.

This is the case in India, where "services offered are becoming more complex and cutting-edge and revolving around the Internet," said Doyle. The time zone difference between the U.S. and India lets workers engage in Internet projects around the clock.

Julie Giera, an analyst at Giga Information Group Inc. in Cambridge, Mass., said offshore development has risen more than 25% in the past seven to eight months.

One factor is the skills shortage, Giera said. A study from the Information Technology Association of America in Arlington, Va., estimated that U.S. employers will need 1.6 million IT workers during the next 12 months but that about half of those positions will go unfilled.

Control Freak

Piyush Gupta, CEO of LiquidPrice.com, offers his offshore outsourcing strategy:

1. Retain ownership of the technology.
2. Select areas of work that don't require constant phone communication.
3. Choose projects that can be performed in isolation.

Definition for ASPs Emerging

So far, they've been all over the map

BY JAMES COPE

A more refined concept of the role of application service providers (ASP) may crystallize this year, according to a study released last week by Cahners In-Stat Group in Scottsdale, Ariz.

In an effort to define the ASP model, the Cahners study, authored by analyst Kneko Burney, posed a series of questions to 100 ASPs. According to Burney, most respondents said they wanted to "do everything," from providing high-speed Internet access to hosting and managing applications for businesses. Many, she said, "are not focused at all."

"This is very reflective of the fact that the market [for ASPs] is evolving and emerging," Burney said. "Often, it's unclear what an ASP provides a customer."

But Burney and others see that situation changing as ASPs begin to form key partnerships and narrow their focus.

She noted that telecommunications carriers are getting into the act, with companies like AT&T Corp. and Sprint Corp. providing the network infrastructure for ASPs and forming co-marketing alliances with them.

According to the Cahners study, ASPs will spend up to $1 billion for internetworking infrastructure equipment this year.

This, Burney said, tells businesses that an ASP's applications are being served from a reliable network and that there's some technological muscle behind the ASP to resolve any reliability issues.

Burney said that in those cases, it's the carrier, not the ASP, that will end up owning the customer relationship.

Burney said she's seeing evidence that some ASPs are getting the idea that they can't be all things to all customers.

"They're beginning to specialize [in serving specific applications]," she said.

Gayle Howard, electronic-business applications director at Sprint in Dallas, said ASPs "have to have personnel that specialize by application" to be successful. And the requirements grow in proportion to the area served.

Annapolis, Md.-based USinternetworking Inc. (USi) is betting that its 1,200 employees will keep it ahead of the pack. Internet Research Group in Los Altos, Calif., ranked USi as the top ASP by number of customers in a February study.

USi's customer list is a formidable one. It hosts applications for Knoll Pharmaceutical Co. in Mount Olive, N.J., Providian Financial Corp. in San Francisco and Hershey Foods Corp. in Hershey, Pa. Applications served from USi's data centers include those from Ariba Inc., Lawson Software, Microsoft Corp., Oracle Corp. and PeopleSoft Inc., said USi Senior Vice President Michele Perry.

USi is getting more company as more firms call themselves ASPs. Burney said there were roughly 70 ASPs last year and more than 100 by the end of the first quarter.

"Everyone but my mother is calling themselves an ASP, and now she's thinking about it," Perry said. "A true application service provider should be able to deliver the hardware, application software, network infrastructure and take full responsibility for a monthly fee."

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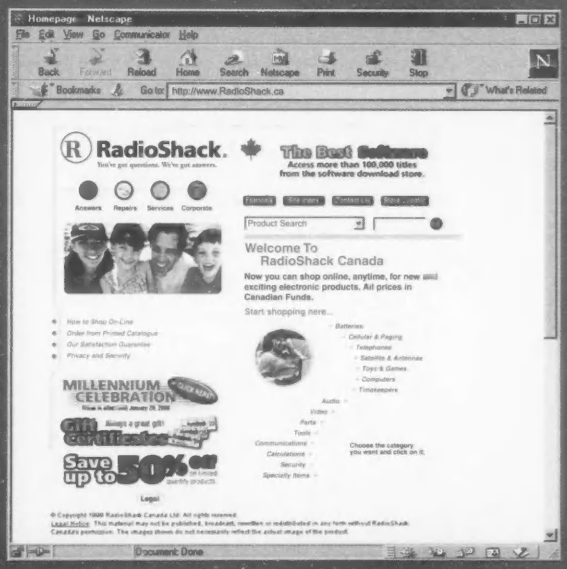

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Stolen Laptop Prompts Call for Internal Reviews

Incident demonstrates shortcomings of intrusion detection

BY JAIKUMAR VIJAYAN

IF YOUR FIREWALLS, intrusion-detection software and encryption technologies make you feel safe, think again.

As the recent incident involving the theft of a U.S. State Department laptop demonstrates, having the best protection against external crackers means little if sensitive data is allowed to simply walk out the door.

"Statistically, 60% of computer crimes happen inside [companies]," noted Winn Schwartau, founder of the security consultancy Interpact Inc. in Seminole, Fla.

"Putting all your efforts on intrusion detection at the perimeter of the network is a failing policy if that is all you are going to do," said Schwartau, who is releasing a book on security issues, called *Cybershock*, later this month.

The State Department last week said the FBI is leading an investigation into the disappearance two months ago of a laptop that might contain highly classified material. Last month, a laptop containing sensitive data about Northern Ireland was stolen from an agent of Britain's MI5 internal security bureau.

Laptop theft poses a major risk when it comes to compromising corporate data, and it will only get worse with the increase in the use of handheld devices, said Chris Christiansen, an analyst at International Data Corp. in Framingham, Mass.

Safeware, The Insurance Agency Inc. in Columbus, Ohio, estimates that 319,000 laptops were stolen in the U.S. last year.

People are walking around carrying "corporate passwords, internal phone lists, memos and details on proprietary projects" that could cause damage if it were to fall into the wrong hands, Christiansen warned.

A virtual flood of products for securing laptops and tracking them down when stolen is available from vendors such as Absolute Software Inc., SAFElink Corp., Targus Inc. and Quantum Power Labs Inc.

The Toronto offices of insurance firm Jardine Lloyd Thompson Canada Inc. used one such product to quickly track down a laptop that was stolen from an employee's car last year.

Today, the company has the software installed on all laptops and has instructed its employees not to leave notebooks unattended. "But generally speaking, the larger the corporation, the more difficult it becomes to police these things," said Rick Smith, the firm's vice president of information technology.

Taking Practical Steps

"If you are concerned about sensitive information being carried on mobile devices, you want to be able to impose control on who can access that information," via measures like encryption, said Eric Hemmendinger, an analyst at Aberdeen Group Inc. in Boston.

Laptops are by no means the only source of risk, though, analysts warned. Security risks include people who inadvertently unleash viruses on corporate networks, disgruntled employees, indiscriminate access to corporate facilities and a lack of controls over who gets access to the Internet. So it's a mistake to rely solely on technology to reduce security risks, Schwartau said.

Instead, Schwartau warns in his book, corporations need to focus on employee education and awareness training, putting security policies in writing, shredding materials such as personnel lists, erasing hard disks prior to disposal and periodically checking company passwords to make sure they're not easy to crack.

AT A GLANCE

Prudent Precautions

Nontechnical security measures companies can take:

- Have a corporate policy, put it in writing and get top-level support.
- Create your own computer emergency response team for handling catastrophic computer and network problems and hacker attacks whether from the inside or outside.
- Make employee education and awareness a high priority.
- Advertise to your staff that you employ the latest and greatest in security monitoring – whether you use it everywhere or not.
- Shred or burn the important stuff.

SOURCE: WINN SCHWARTAU, AUTHOR OF THE SOON-TO-BE-PUBLISHED BOOK *CYBERSHOCK*

Analysts: Mafiaboy Only Amateur Copycat

Stronger filtering tools could have foiled such an attack; ISPs urged to cooperate

BY ANN HARRISON

The Canadian teen-ager known as Mafiaboy who was arrested last week in connection with an attack against the CNN Web site is an amateur who simply copied tactics used by far more sophisticated attackers who may never be caught, security analysts said.

Despite the hoopla surrounding the 15-year-old's arrest on "mischief to data" charges related to an attack on CNN's Web site on Feb. 8, Mafiaboy is likely not responsible for three other denial-of-service attacks launched earlier. The sites affected between Feb. 7 and 14 were Yahoo Inc., eBay Inc. and Amazon.com Inc.

"He's a 'me-too guy,' just responsible for the CNN denial-of-service that came after the first major hit of Yahoo," said Chris Davis, CEO of Hexedit Network Security Inc. in Ottawa. "The people who instigated it are a bigger threat; they are some of the best in the world, and these are the people I fear daily."

Davis said the tools used in the original attacks were created by much more skillful attackers and could be used again to breach the defenses of e-commerce sites.

"They are so good, you won't catch them unless they make a major mistake," said Davis. "They come up with new stuff all the time, and it is very difficult to stay ahead of them."

Davis said another part of the problem lies in the fact that Internet service providers and other outfits that make up the Internet backbone aren't using Ingress filtering, which prevents packet spoofing.

The denial-of-service attacks defeated many defenses because the packets that flooded the targeted servers appeared to be coming from a legitimate source. Ingress filtering can determine whether a packet was indeed sent from a particular location; if its address is spoofed, it's stopped at the router.

> The people who instigated [the attacks] are a bigger threat.
>
> CHRIS DAVIS, CEO, HEXEDIT NETWORK SECURITY INC.

But Michael Lyle, chief technology officer at Recourse Technologies Inc. in Palo Alto, Calif., noted that this type of filtering affects network performance. In addition, the database for IP addresses isn't always accurate and could result in a loss of legitimate network traffic.

"Databases need to get better, and there needs to be better tools for putting together filtering lists for different service providers automatically," said Lyle.

Stop-gap Solution

Another technology some sites are pursuing is a rate-shaping filter that can choke off traffic to a router before it floods a server. According to Lyle, this type of filter on a Cisco Systems Inc. router could be set so that it wouldn't accept more than, say, 500K bits of data on a network connection.

"This is just a stop-gap solution because, ultimately, the attacker will learn to flood with things that look like legitimate network connections like HTTP requests," said Lyle. "It makes sense to shut off the source of the attacks where they are coming from rather than shut them off as they are coming in the door."

While the initial attackers may never be caught, Lyle said denial-of-service attacks have prompted the information technology community to seek a greater degree of cooperation among service providers to exchange information about attacks, capture data and protect sites.

Mafiaboy appears to have used an exploit associated with the Washington University File Transfer Protocol. This gave him remote access to machines where he could plant a tool called Tribe Flood Network, which flooded targeted servers with packets.

"You can get Windows versions of any of those [tools], so any 15-year-old with a Windows 98 computer can take down Yahoo," said Davis. "It's scary."

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BRIEFS

Chiquita to Upgrade Infrastructure

Chiquita Brands International Inc. in Cincinnati will upgrade its information technology infrastructure at nine sites worldwide as part of its global expansion. The IT upgrade is part of an efficiency drive by the fruit and vegetable producer and distributor, which last year cut more than 200 jobs and in March reorganized its operations, for an estimated annual savings of $20 million.

Domain Name Growth

The Internet Corporation for Assigned Names and Numbers in Marina del Rey, Calif., will consider adding new top-level domains at its July meeting in Yokohama, Japan, as a result of a committee vote last week. It hasn't yet decided what those domains should be or how they should be issued.

SAN Center Has Home

The Mountain View, Calif.-based Storage Networking Industry Association (SNIA) last week announced the formation of an industrywide facility for storage networking technology education and interoperability testing. The SNIA Technology Center will be located in Colorado Springs and will open later this year.

Short Takes

SILICON GRAPHICS INC.'s sales for its fiscal 2000 third quarter, which ended March 21, totaled $564 million, down from $619 million for the same period last year. . . . Pleasanton, Calif.-based COMMERCE ONE INC. reported first-quarter revenue of $35 million, compared with first-quarter revenue of $2.1 million in 1999. Losses were $14 million, compared with $7.8 million for the same period last year. . . . Mountain View, Calif.-based VERITAS SOFTWARE CORP. lost $174.3 million in the first quarter, compared with $13.5 million in 1999's first quarter. Sales totaled $244.6 million for the quarter, up from $134.7 million for the same period a year ago.

Clinton Gets Mixed Reviews at Comdex

There were a lot of empty seats during the president's keynote address

BY LEE COPELAND
CHICAGO

LAST YEAR, Microsoft Corp. Chairman Bill Gates delivered the keynote address at Comdex/Spring to a standing-room-only audience. Last week, President Clinton took the podium at the trade show here and spoke to a less-than-capacity crowd.

Clinton made Comdex/Spring 2000 the final stop on his Digital Divide New Markets tour, urging high-tech companies to help bridge the gap between affluent communities with access to computers and the Internet and those without such access.

"I came here today to ask you to set another trend — to devote more time and technology, more ideas and energy, to closing the digital divide," Clinton said. He said that more than 400 organizations had signed up to participate in the initiative. But among show attendees, his call to action received mixed reviews.

Access Issues

"I don't think the government has any business in this," said Randy Gibson, a systems administration supervisor at software maker Basis International Ltd. in Albuquerque, N.M.

"The government does not need to step in and provide free Internet connection to everybody when you can pretty much get it for free if you know what you are doing," Gibson said. "The problem is not the rich keeping technology away from the poor, and the government should not come in and tax people for a program that probably won't help anyone anyway."

"There are some challenges ahead, but [Clinton] has clearly defined an agenda, and it will be up to us to execute it," countered Keith Hartley, director of marketing at SteelEye Technology Inc. in Mountain View, Calif. "The private sector does owe back to the economy and the government to help the government spur new markets. It's not enough to capitalize on the existing markets as the economy changes. We need to work with the public sector."

PRESIDENT CLINTON reiterated at Comdex that he wants to close the 'digital divide'

The president asked information technology companies and professionals to help put computers and Web access into schools, expand internships and deepen talent pools to include more ethnic and gender diversity.

According to the U.S. Department of Commerce, 30% of white Americans and 36% of Asian Americans have Internet access at home, while only 11% of African Americans and 13% of Hispanic Americans have that access.

Clinton couched his pitch in economic terms, arguing that closing the gap would create new businesses and new sources of employees and customers.

But "people vote with their attendance," said analyst Phil Russom at Hurwitz Group Inc. in Framingham, Mass. "The [relative] lack of people there shows a lack of interest. High-tech firms are run by quick, relatively young people. Historically, concern for philanthropy comes at later stages in people's lives."

Republicans Vow Less Interference With Net

Industry panel airs concerns at Comdex

BY DOMINIQUE DECKMYN
CHICAGO

In a roundtable discussion last week between Republican congressmen and representatives of the technology industry, politicians did their best to pander to the concerns of the high-tech industry, promising less regulation, a continued moratorium on Internet taxes, more H-1B visas and expanded trade opportunities with China.

The discussion took place at the Comdex/Spring 2000 trade show here.

Opening up the doors to trade with China and creating more H-1B visas for foreign high tech workers were the top concerns voiced by the industry panel. Its members included representatives from Microsoft Corp., Schaumburg, Ill.-based Motorola Inc., Plano, Texas-based Electronic Data Systems Corp. and several small and midsize companies.

The congressional delegation included some of the most active Republicans on technology issues, such as Reps. Chris Cox (R-Calif.), chairman of the House Policy Committee, and Billy Tauzin (R-La.), chairman of the Telecommunications Subcommittee.

REP. JERRY WELLER wants to see PC depreciation cut to one year

A day after President Clinton called on the Comdex crowd to help close the "digital divide" between the technology haves and have-nots, several Republicans discussed their approaches to the problem. Rep. Jerry Weller of Illinois, who hosted the roundtable, struck a chord with the technology industry panel when he discussed two acts he has proposed. One would allow firms to depreciate the costs of PCs in one year instead of five. The other would give companies tax credits for PCs they give to employees.

Weller lauded General Motors Corp., American Airlines and other companies for providing PCs to workers.

"Unfortunately, what these companies have learned is that the IRS wants to tax [such gifts]," he said. He also said he hopes to see action before the end of the year on his proposal to shorten PC depreciation.

Jon "Maddog" Hall, president of Amherst, N.H.-based Linux International, proposed that year-old PCs could be donated to schools.

Tauzin, who spoke during much of the three-hour discussion, called for further deregulation of the telecommunications industry, saying competition is the best way to ensure that consumers have cheap broadband Internet access. He also called on industry representatives to support HR 2420, the Internet Freedom and Broadband Deployment Act of 1999, which may soon have enough co-sponsors to bring to the floor of the House.

Tauzin said laws that aim to guarantee universal access to broadband should be considered only as a last resort.

Privacy Debate

Several speakers came out against government interference in guaranteeing privacy on the Internet. Bob Goodlatte (R-Va.) criticized the strict regulatory approach taken by the European Union, saying that approach has generated "very little results."

Goodlatte said strong consumer reaction against U.S. firms that have infringed on customer privacy has caused these companies to recoil. But Tauzin argued that the issues involved aren't yet sufficiently understood.

"We are not ready to sort this out; we need some help," said Tauzin, calling on technology industry representatives to attend an information session next month about privacy.

Quicken Throws Hat Into Bill Payment Ring

BY MARIA TROMBLY

Joining the likes of Yahoo Inc. and Microsoft Corp.'s MoneyCentral, Intuit Inc.'s Quicken.com is offering MyFinances. The all-purpose financial services dashboard offers everything from bill paying to stock tracking.

Though Quicken is a big name in the area of money management, it will be going head-to-head with some big players — including banks themselves.

Mountain View, Calif.-based Intuit has teamed with 33 banks, 15 brokerages and eight credit-card companies — with another 57 banks and credit-card companies expected to join in the next couple of months. However, many banks already offer electronic bill paying and other financial services online.

Catching Customers

"If you've got customer satisfaction already existing for a bill payment solution with a bank, it's going to be difficult to move a customer to this service," said Randi Purchia, an analyst at Newton, Mass.-based Meridien Research Inc. "But if you've got a new user, those are the ones you might be able to catch."

Intuit's service may also be attractive to customers who move and change banks frequently, she added.

Another set of candidates is people who have multiple bank accounts, said George Barto, an analyst at Stamford, Conn.-based Gartner Group Inc.

"Customers know that if they sign up with their bank, the bank will only make payments out of the checking account at that bank," he said, adding that some customers also pay bills out of brokerage accounts or other sources.

For those customers who pay their bills out of a single checking account, however, Intuit's service will probably not offer any additional benefits and may cost more to use, Barto said.

In addition, the bill payment service might create conflicts with the banks themselves. "Banks do see bill payment as their purview," Barto said. "They really don't want somebody bypassing them."

According to Gartner Group research, online bill payments are expected to increase from around 1% today to more than 25% in 2004.

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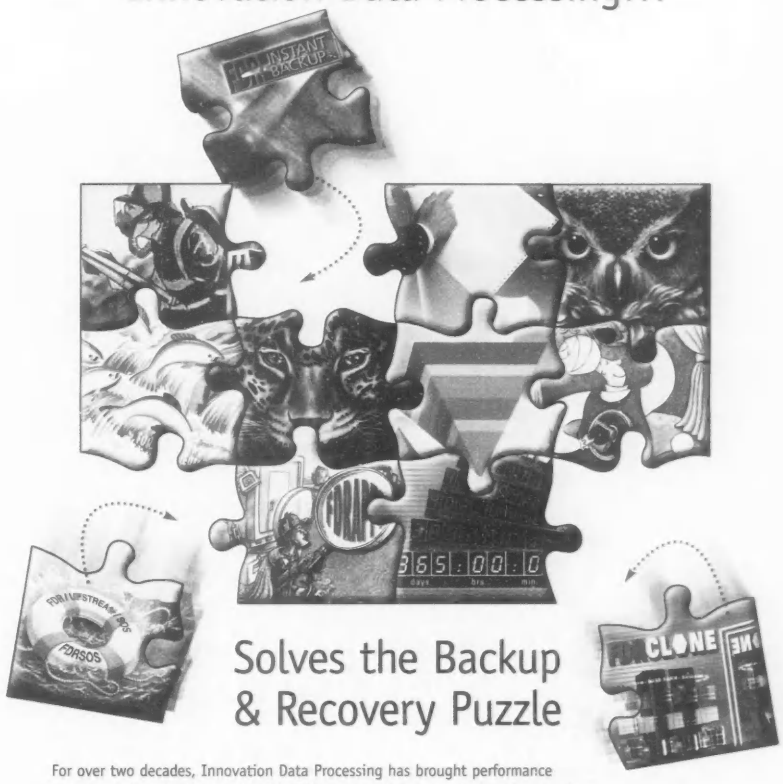

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Users Tell Storage Vendors to Get Along

BY KATHLEEN OHLSON
PALM DESERT, CALIF.

Users at a conference here last week griped about storage-area network (SAN) vendors that are unable to work together.

"It's not a lack of standards, it's the lack of consistency and implementation," said Richard Boyle, vice president of technology deployment at The Chase Manhattan Corp.'s Global Private Banking unit in New York. Standards could be created, but they're open to interpretation, and it's the subtle differences that stop interoperability. "No one is saying, 'I'll be the benchmark for these standards,' " Boyle said.

The two vendor standards groups, the Storage Networking Industry Association (SNIA) and the Fibre Alliance, "need to stop the infighting and agree to disagree," said Earl McAllen, program manager at Computer Sciences Corp. in El Segundo, Calif., and former information systems manager at Enron Corp. in Houston. "The blocks are there, but everybody wants to rearrange them."

Information technology managers want standards, and the lack of software completeness and maturity are inhibiting SANs, said Bob Gray, an analyst at International Data Corp. in Framingham, Mass.

In the Works

The SNIA and the Fibre Alliance, led by Hopkinton, Mass.-based EMC Corp., are both working on SAN-related standards, such as global file systems and routing. The Fibre Alliance last summer submitted the management information base (MIB) specification, which will standardize how storage devices will be addressed on the network. Although the SNIA gave its input and MIB is now before the Internet Engineering Task Force, no approval date is known.

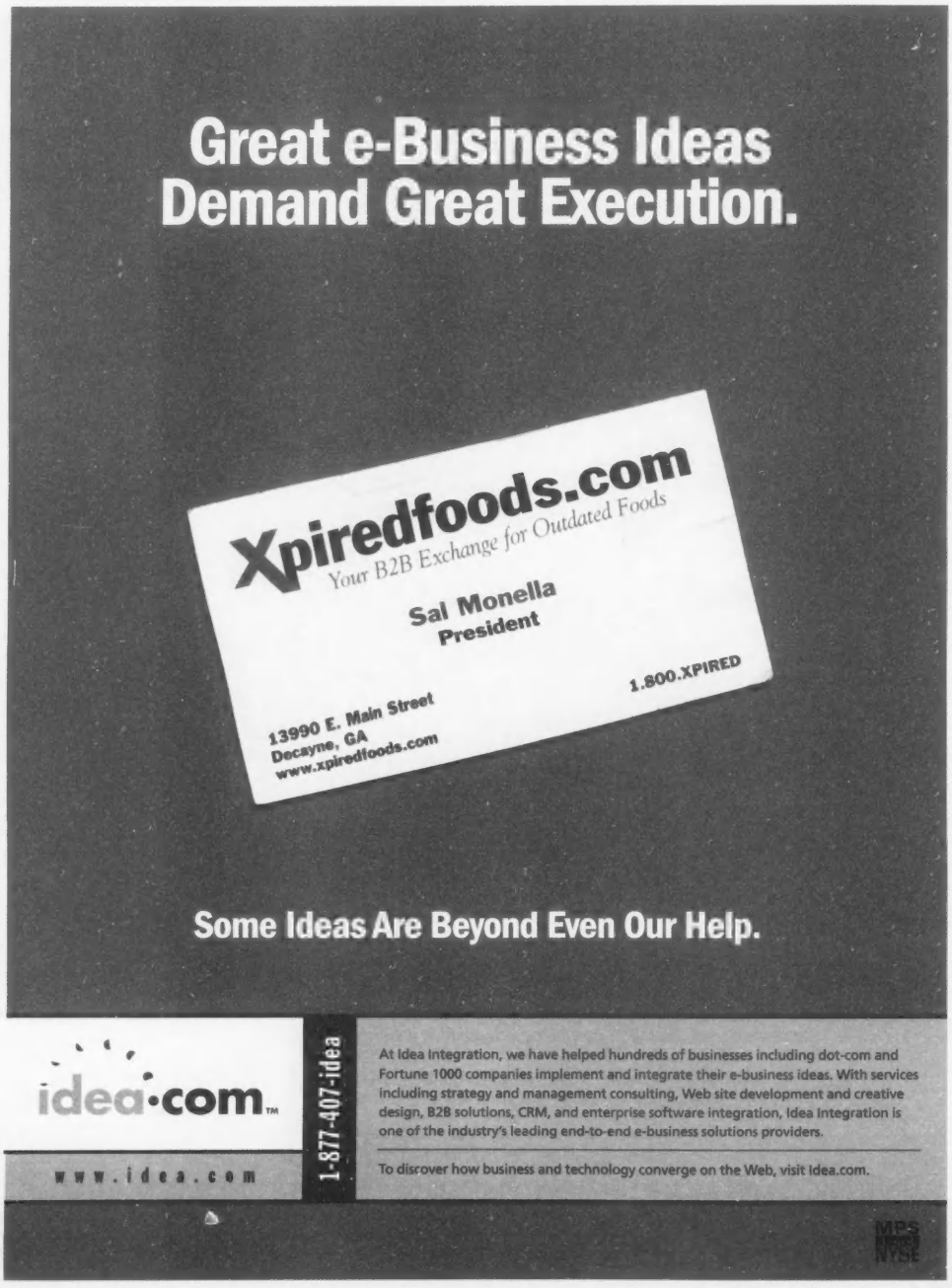
But the SAN standards issue may be resolved by an unlikely group — networking companies such as San Jose-based Cisco Systems Inc., according to Lauri Vickers, an analyst at Cahners In-Stat Group in Scottsdale, Ariz. Cisco, which owns the router market, has the IT confidence and the size to force whatever standard it develops down the other vendors' throats, she said.

SAN Standards

Here are some of the companies involved in standards organizations:

Storage Networking Industry Association:
- Compaq Computer Corp.
- Dell Computer Corp.
- EMC Corp.
- Hitachi Data Systems
- Storage Technology Corp.

Fibre Alliance:
- EMC Corp.
- Vixel Corp.
- StorageNetworks Inc.
- Legato Systems Inc.
- Veritas Software Corp.



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'E-Government' Spending To Soar Through 2005

CIOs play catch-up with private industry in offering online services to customers

BY PATRICK THIBODEAU
WASHINGTON

With the year 2000 problem behind them, federal and state CIOs are rushing to catch up with the private sector in offering online services.

Analysts expect spending on government-related Internet ventures — and public information technology projects generally — to soar in the years ahead (see chart). Stamford, Conn.-based Gartner Group Inc. says spending on government Internet activities will increase from $1.5 billion this year to $6.2 billion by 2005.

This task, however, is filled with obstacles. Many public-sector e-commerce efforts have been disjointed. For instance, the federal government has more than 20,000 Web sites that use different formats and standards and have no single portal to tie them together.

The federal government "is still kind of operating in its feudal stovepipe mode," said Alan Balutis, deputy CIO at the U.S. Department of Commerce.

Federal agencies are developing an online portal that may be ready by year's end. But providing online services goes beyond that — it also means integrating back-end and online systems as well as dealing with complex privacy issues. There are, however, financial incentives for solving these problems.

"Ninety percent of our [customer] interactions are face-to-face, time-consuming and very costly," said Doug Robinson, an IT official at the Kentucky governor's office.

At two conferences last week, the FOSE trade show and McLean, Va.-based Federal Source Inc.'s State of the States conference, government CIOs said public agencies can save money, improve customer service and streamline operations by offering online services. Arizona, for instance, drastically cut motor vehicle department waiting-line times by moving some services such as registration renewals online.

Quality Counts

Public officials say users expect the same kinds of around-the-clock services and personalized experience they get from visiting private-sector business sites.

This push to online government is also making public officials more "brand-conscious" as a way of building customer relationships. "Branding is critical to state government," said Robinson, whose state advertises its online services as KyDirect. "We want [customers] to feel comfortable."

George Molaski, CIO at the U.S. Department of Transportation, said the government can do more to brand the services used by private third parties. For instance, some travel Web sites are using U.S. Federal Aviation Administration radar data to show plane locations, but users may not know that. "We're not communicating back to the citizen that this is in fact a product of your tax dollars," he said.

CIOs also say users need to feel they can trust the government to protect information.

Allisoun Moore, CIO for the state of Maryland, which plans to offer 80% of its state services online by 2004, said she believes a "natural trust" will build up with users overtime. "We all used to wonder whether our credit-card numbers would be misused when we made an electronic purchase," she said.

But Otto Doll, South Dakota's CIO, said the public is increasingly worried about how individual information is being aggregated and who is getting access to that information. State officials "are getting hammered more and more relative to these questions," he said.

Government IT Growth

STATE AND LOCAL TOTAL IT EXPENDITURES

2000	$37B
2001	$39B
2002	$42B
2003	$44B

SOURCE: FEDERAL SOURCES INC., MCLEAN, VA.

FEDERAL, STATE AND LOCAL ELECTRONIC-GOVERNMENT EXPENDITURES

2000	$1.5B
2001	$2.0B
2002	$2.6B
2003	$3.5B
2004	$4.7B
2005	$6.2B

SOURCE: GARTNER GROUP INC., STAMFORD, CONN.

Government IT spending growth over the next few years will be driven in part by electronic-business-related investments in hardware, software and services. Replacement of legacy equipment, particularly in the health and human services areas, will also boost IT spending.

Feds Consider Upping Pay for IT Workers

Looming retirement, industry pay scales threaten staffing

BY PATRICK THIBODEAU
WASHINGTON

Federal officials are taking a hard look at increasing the pay rates for information technology employees in order to stay competitive with the private sector.

The need will be especially acute as federal worker retirements mushroom during the next few years.

The Chief Information Officers Council is conducting a study with the National Academy of Public Administration to determine whether pay scales should be permanently increased for federal IT workers.

"If we don't do something soon, we're going to be in more [of a] crisis than we're in now," said Gloria Parker, CIO at the U.S. Department of Housing and Urban Development.

A separate study by the U.S. Office of Personnel Management (OPM) is examining whether there should be a temporary increase in federal IT worker salaries. The government has already increased salaries of highly skilled occupations, such as medical officers, to compete with the private sector.

Federal agencies are reporting numerous unfilled IT positions. They're hardly alone; the Information Technology Association of America in Arlington, Va., estimated that U.S. companies will be able to hire only half of the 1.6 million IT workers needed this year. But the federal government faces unique problems.

Starting wages run from $23,000 to $35,000 per year, a range considered well behind salaries paid to entry-level IT professionals in the private sector. Government agencies can't offer stock options. And though agencies can offer retention bonuses, they often don't have the money to do so.

However, the most pressing problem concerns age. Roughly half of the nearly 70,000 current federal IT workers will be eligible for retirement by 2006.

The study could lead to salary scale increases of as much as 30%, said Henry Romero, an associate director at the OPM. The study should be completed by the end of the year, he said.

But federal agencies are trying to do more than increase salaries. There is legislation pending in Congress that would pay the cost of academic degrees for federal employees, along with licenses and certificates.

Private-sector employers are finding that base pay is becoming less important to IT workers, said Rick Distasio, a vice president at Compaq Federal LLC, a unit of Houston-based Compaq Computer Corp. that works with the federal government.

More important now, said Distasio, are annual stock and cash-based incentives.

AT A GLANCE

Federal IT Workforce

The outlook: By 2006, the federal government IT workforce will be relatively stable in size but is expected to grow by a few thousand employees to about 71,000.

Main problem: During the next five years, the federal government will have to replace approximately 32,000 IT workers due, in large part, to a retirement "bubble."

Chief challenge: Entry-level federal IT jobs pay from around $20,000 to $30,000 per year, while private-sector IT jobs typically start somewhere between $30,000 and $50,000, according to *Computerworld* salary surveys.

Compaq Lays Off 450

BY JACK McCARTHY
SAN FRANCISCO

Compaq Computer Corp. has laid off about 450 employees as part of its continuing efforts to slash its worldwide workforce by 7,000 people, a company spokesman confirmed last week.

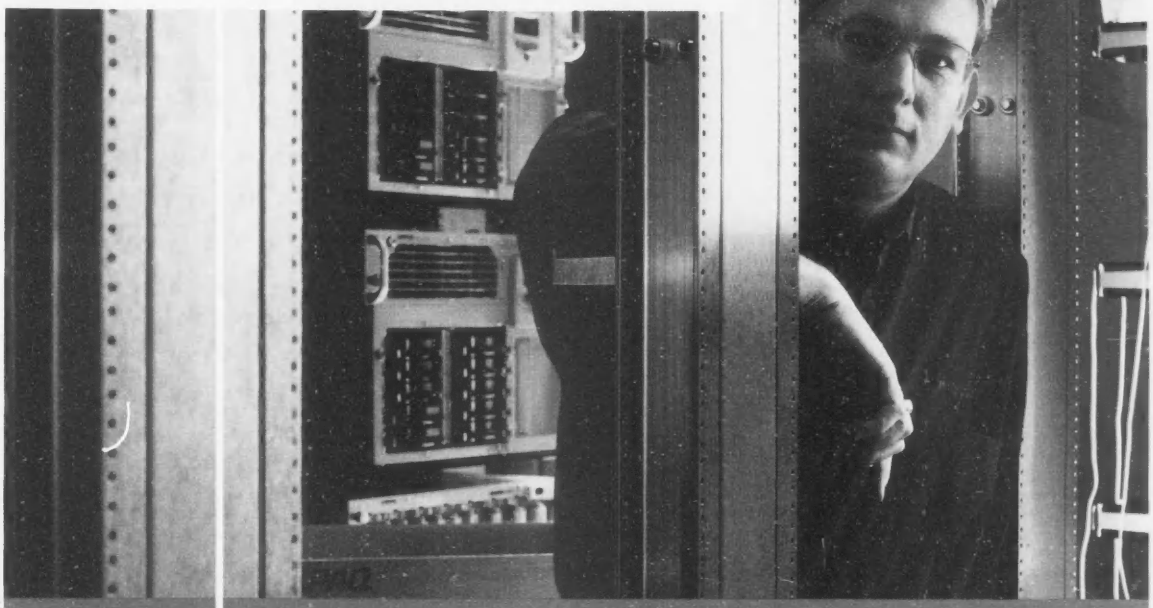
The latest job cuts occurred at the Houston-based Consumer PC Group, said Compaq spokesman Alan Hodel.

Last July, Compaq CEO and President Michael Capellas announced that the firm would lay off between 6,000 and 8,000 people from a total of nearly 70,000 employees after the company posted a loss of $184 million.

McCarthy writes for the IDG News Service in San Francisco.

Kaj Pedersen, VP of Engineering, **Quote.com**

"Reliability is key. In terms of stability and reliability, I've found the Windows and Compaq ProLiant environment to be significantly better than our Sun environment."



"Now that we've gone in this direction, we're also finding that our cost is substantially reduced."

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BRIEFS

SQL Server 2000 Beta For Windows CE

Microsoft Corp. has announced that a beta version of SQL Server 2000 Windows CE Edition is scheduled to be available June 30. The product supports Windows CE platforms, including Pocket PC, Handheld PC and embedded systems running the Windows CE 2.11 operating system or later versions.

Keane Wins Contracts From J. P. Morgan

Keane Inc., a Boston-based systems integrator, said it has made a deal with J. P. Morgan & Co., a New York-based global investment bank, for two separate information technology projects. The first involves building a data repository for the bank's fixed-income instruments information. Keane said it also will support and enhance a reference data services operation for the bank.

Security Hole in Netscape Browser

Peacefire.org, an online civil liberties organization in Seattle, last week revealed a security hole in the Netscape Communicator 4.x browser that allows malicious Web sites to gain access to files on users' hard drives. The problem affects users running the browser for Windows, with cookies and JavaScript turned on.

Manufacturers Keep Customers With Web

Keeping current customers happy – rather than finding new ones – is the chief reason manufacturers are moving into e-commerce, according to a survey of 60 senior manufacturing executives conducted by the National Association of Manufacturers in Washington.

The survey, released last week, showed that 89% of respondents said that customer satisfaction was their top e-commerce driver.

Creating new sales channels was cited by 70% of respondents, and reducing order processing and transaction costs was cited by 68% of respondents.

Early Corporate Users Plan Pocket PC Pilots

Hotel operator will pit Palms against Microsoft's device

BY BOB BREWIN

EARLY corporate users of Microsoft Corp.'s Pocket PC, introduced last week, plan to pilot the device — in one case evaluating its performance against personal digital assistants (PDA) from Palm Inc. — before making a decision on full-scale deployment.

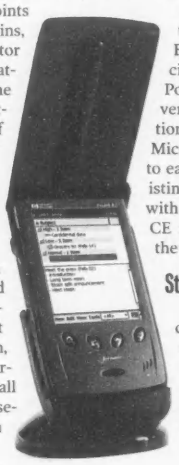
Starwood Hotels and Resorts Worldwide Inc. in White Plains, N.Y., plans to have guest-room cleaning supervisors test a rugged wireless Pocket PC from Symbol Technologies Inc., while at the same time rolling out a remote check-in and checkout service that uses wireless handhelds.

Testing Casio's Device

EMC Corp. plans to run a pilot using Pocket PC hardware from Tokyo-based Casio Computer Co. with its regional technical specialists who perform high-level maintenance, troubleshooting and repair on storage systems installed at customer sites.

Danny Hudson, vice president of distributed systems at Starwood, described himself as "device-agnostic," adding that at the end of the PDA test, he plans to choose one device for both applications. Hudson said Starwood, which operates the Luxury Collection, Sheraton, Westin, Four Points and W hotel chains, will carefully monitor the Pocket PC's battery life during the tests. "We want batteries capable of lasting an entire shift," he said.

Starwood's Palm-based remote check-in and checkout system is well along in development and will be quickly deployed throughout the Westin chain, said Hudson. Starwood plans to install the Pocket PC housekeeping system in 50 hotels during the next 10 months in a broad test.



USERS WILL TEST Pocket PCs like this one, Hewlett-Packard's Jornada

Both the Palm and Pocket PC devices will communicate with wireless LANs installed throughout the hotels. These networks should make it easier for guests to check in and out anywhere on a hotel property, Hudson said, with a PDA-equipped employee able to swipe a credit card "in the restaurant after you've finished breakfast."

EMC technicians have already adopted Palm devices, according to Michael Cipriano, director of customer service at the Hopkinton, Mass.-based company's information systems group. But the company decided to pilot the Pocket PC due to "a very significant relationship" it has with Microsoft and the ability to easily synchronize existing corporate systems with the new Windows CE operating system in the Pocket PC.

Stability Is Key

EMC's test will focus on the stability and ease of use of the new Windows CE operating system, Cipriano said. Critics have bashed previous versions of Windows CE.

Recalling their experiences with Windows 3.0 and the third release of Windows NT, Microsoft executives were widely quoted last week, saying it takes them three tries to field a stable platform.

Ken Dulaney, an analyst at Gartner Group Inc. in Stamford, Conn., said he wasn't surprised that some of the early corporate adopters of the Pocket PC were users of the kind of embedded systems made by companies such as Holtsville, N.Y.-based Symbol Technologies, because earlier versions of Windows CE had done well in the embedded market. Dulaney called the Pocket PC an "adequate" platform for corporate users and predicted that in the near term, both Santa Clara, Calif.-based Palm and Microsoft will do well in the corporate market. ◗

Heavyweights Will Support The Pocket PC

Microsoft backed its launch of the Pocket PC last week with an impressive list of heavyweight application developers and systems integrators in the company's third attempt to shrink its Windows operating environment for easy-to-use handheld devices.

Palm Inc. in Santa Clara, Calif., Microsoft's chief competitor in the handheld market, quickly fired back that it not only had agreements with many of the same independent software vendors but also had a far larger pool of 60,000 software partners.

Ken Dulaney, an analyst at Gartner Group Inc. in Stamford, Conn., looked at the Microsoft list and said, "This is a bit of fluff. [Microsoft] had to do this to compete with Palm, but [the list] does not mean they're all there yet."

Companies on the list included Baan Co.; Citrix Systems Inc.; Computer Associates International Inc., which plans to support use of its Unicenter TNG on the Pocket PC; Oracle Corp.; SAP AG; and Sybase Inc. Microsoft said it has also signed up 130 integrators, including Ameranth Technology Solutions Inc., Cap Gemini Group, Electronic Data Systems Inc., Forte Systems Inc. and the SEMA Group PLC.

Keith McNally, president of Ameranth in San Diego, which is developing a Pocket PC system to help Starwood Hotels and Resorts track the conditions of guest rooms said, "We've already experienced tremendous enterprise demand for Pocket PC-based wireless solutions."

– *Bob Brewin*

SAP America CEO Quits In Wake of Poor Results

BY CLARE HANEY

Executives leaving the U.S. operation of enterprise resource planning software vendor SAP AG continued last week with the company announcing that the head of SAP America Inc. has quit.

Kevin McKay, CEO of SAP America in Newtown Square, Pa., resigned from the company effective immediately, SAP said.

McKay chose not to accept an offer from SAP's board of directors to become chief financial officer of parent company SAP AG.

Meanwhile, SAP AG reported a 43% drop in net income for its quarter ended March 31, compared with the same period last year. Company executives described the quarter as "challenging."

Revenue in the Americas region fell 3% compared with the same quarter last year.

Wolfgang Kemna, managing director of SAP Germany, will take over as SAP America's CEO. Ernie Gunst, managing director of SAP Switzerland, will add Kemna's German duties to his current role.

Rumors Swirling

McKay became SAP America's CEO after Paul Wahl, the previous chief, quit in September 1998. Rumors had been swirling for the past few months that McKay would leave SAP, according to Harry Tse, an analyst at The Yankee Group in Boston. Tse said he expects that McKay will head a start-up company. ◗

Haney writes for the IDG News Service in San Francisco.

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Service feeds data to multiple exchanges

BY JULIA KING

SLOWLY BUT surely, more software tools and services to help companies on the sell side of the business-to-business e-commerce equation are hitting the market.

Last week, Haht Software Inc. in Raleigh, N.C., announced its Sellside Exchange, a subscription-based Internet marketplace where suppliers can integrate product, customer and other data into multiple online exchanges. The fee is $5,000 to $10,000 per month.

For example, a manufacturer of electronic components could use Haht's service to feed pricing and product data from its in-house enterprise resource planning (ERP) system to various industry exchanges.

Haht is also offering a companion software product called Sellside Links, which is hosted and maintained by suppliers. It lets suppliers execute business-to-business electronic transactions directly with customers who are using different procurement systems, including software from Ariba Inc., Commerce One Inc. and SAP AG.

The Haht service and software, like the company's business-to-business e-commerce application software, currently support suppliers using SAP R/3 software and J. D. Edwards & Co. enterprise software.

Suppliers said a key potential benefit of more integration is customer retention.

"Continued integration going back to customers' systems is where e-business is evolving, because that's where customers will save money," said Larry Blazevich, CIO at Sigma-Aldrich Corp., a St. Louis maker of specialty chemicals for research laboratories.

LARRY BLAZEVICH: Integration with customers' systems is key for online business

Many of Sigma-Aldrich's 60,000 U.S.-based customers are huge pharmaceutical firms with the clout to dictate exactly how they want to run their businesses, Blazevich explained.

"We have to be prepared to accept that," Blazevich said. The bottom line is that "it's the cost of doing e-business."

Using the Haht service and software, suppliers can also deliver customized information from back-end systems to individual customers on Internet exchanges.

The ability to differentiate by providing data beyond prices could attract more suppliers to Net exchanges, said Dan Sholler, an analyst at Meta Group Inc. More suppliers would mean more choices for buyers, he added.

Continued from page 1

Amazon

order reached Ernie, the sole Sun Microsystems Inc. SPARCstation V box that served Amazon's Web site. But they might have gone deaf if they had left that system in place. The next year, they relieved Ernie in favor of a Digital Equipment Corp. Alpha 2000 and later added another one because it was "the biggest box out there," Rachmeler said.

"By changing vendors, we were going to give ourselves more room to expand in the long run," she said.

By the spring of 1997, Amazon eased the strain by substituting two DEC 8400s as it launched the second version of its Web site. More significant architectural changes would come later as the company made plans to link up with major portals and to add features such as recommendations and one-click shopping.

"We were scared," Rachmeler said. "We were about to drink from the fire hose, and we had no idea the kinds of traffic that we were going to get from those situations."

The solution: It removed one of the DEC 8400s in favor of redundant DEC 4100s serving Web pages at the front line. "What it allowed us to do is expand the capacity of the Web site only by buying new machines. Instead of spending human power to get more capacity, we could simply use our credit cards and increase the front line," Rachmeler said, noting that Amazon had fewer than 30 IT staffers at the time.

"It also meant that any one of these online machines could be taken off-line for maintenance or if it had hardware problems, and the store would stay open," Rachmeler said.

But Christmas '97 was coming, "and that shouldn't have been a surprise, but it was," she said. The taxed database server was already running on the biggest machine available, so Amazon couldn't put in another box. Instead, a SWAT team launched Project Database Headroom to squeeze out 30% more performance.

"We would go to executives of the company and ask them not to run their reports during the day. We would tell the financial teams not to execute billing programs during peak periods of time. We sent out messages to the entire Amazon staff that if they had programs accessing the database, they needed to talk to this SWAT team," Rachmeler recalled.

Big Iron for Christmas

When the Christmas rush was over, Amazon brought back its idle DEC 8400 as a hot standby, and then over the next two years began cracking off pieces of the main database to run on separate machines. In time for last Christmas, staffers brought in big iron — a Hewlett-Packard Co. V-class machine — to anchor the system. They also split up the Web database from one to four machines and increased the number of online servers.

But in the future, Amazon knows that hardware won't be able to solve every problem. Rachmeler noted that the online retailer's focus will shift to modular software systems, which will help ease development and maintainability.

Giga Information Group analyst Mike Gilpin said Amazon took the right approach to expansion, given its circumstances. Now the company will experience the "classic set of growth pains" encountered by early adopters as they grow to be large companies, he said.

Amazon will need to take a "more controlled approach to software architecture" and do "more separation of function between different layers of the architecture. There never is an easy time to make those changes," he said.

One challenge, for instance, will be solving a "contentious" middleware issue, since the company now uses software from several vendors, according to Rachmeler.

"Moore's Law is not going to save us anymore," she said. "We're going to have to get smarter about the way that we use our systems, not just increasing [capacity and availability] by steroids."

Amazon.com's Launch Time Line

- **July 1995:** U.S. book site
- **March 1997:** Web site Version 2
- **Sept. 1997:** Site Version 3; portal link-up deals with Yahoo, AOL and Excite
- **Nov. 1997:** Site Version 4
- **June 1998:** U.S. music
- **Oct. 1998:** U.K. and German book sites
- **Nov. 1998:** U.S. video
- **March 1999:** U.S. auctions
- **July 1999:** Toys, electronics
- **Sept. 1999:** zShops mall
- **Oct. 1999:** U.K. and German music, auctions and zShops
- **Nov. 1999:** Software, home goods and video games

Continued from page 1

Microsoft

"I was expecting a ho-hum quarter. I was not expecting a lousy quarter," said Bill Epifanio, an analyst at New York-based J. P. Morgan Securities Inc.. Combined with Connors' bleak growth outlook for next year, it makes for a "double whammy" for a stock that's already under a cloud because of the antitrust trial, he said.

Industry analysts confirmed that the commercial PC market is seeing some saturation. One user, Shellie Sommerson, business systems manager at the *Statesman Journal* in Salem, Ore., said her PC spending had slowed a bit this year because the company bought a lot of PCs in preparation for Y2k.

Framingham, Mass.-based International Data Corp. (IDC) is predicting single-digit sequential growth for U.S. commercial PC sales for the rest of the year. IDC analyst Roger Kay said he expects sales to rebound when Windows 2000 takes off late in the year, however.

But Rob Enderle, an analyst at Giga Information Group Inc., said Microsoft "botched" the launch of Windows 2000 by staging a big event before early adopters could show successes. "They will be paying for that for the next six to 18 months," said Enderle.

Laurie McCabe, an analyst at Summit Strategies, said she thinks companies will be buying less PC-centric software, not fewer PCs. Enderle agreed. He said Microsoft's Office 2000, especially, is at "extreme risk" from the move to Web-based, often free applications.

Microsoft has a history of chilling investors' expectations for coming quarters. But analysts said this approach makes little sense when its stock is already under pressure.

Analysts worry Microsoft won't be the only one to suffer. "Every time Microsoft gets walloped, you can expect collateral damage," Epifanio said.

Though Microsoft reported 23% growth in both revenue and net income for the quarter, earnings per share would have missed consensus estimates if not for better-than-expected investment gains, said Jeff Maxick, director of research at Madison Securities Inc. in Chicago.

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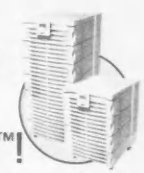

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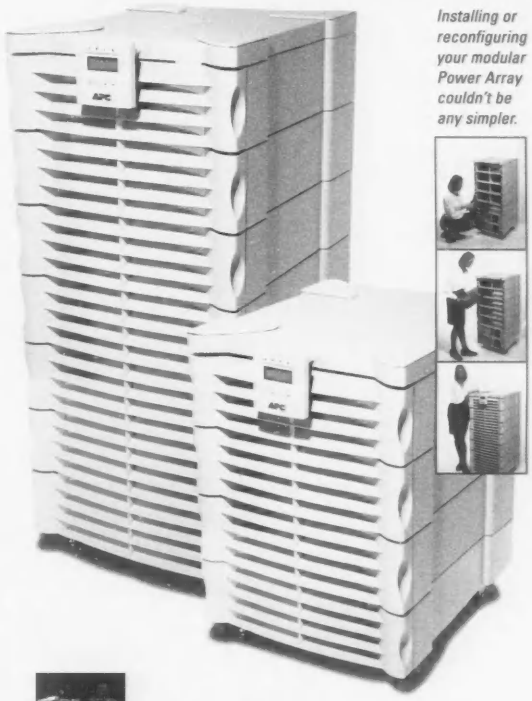

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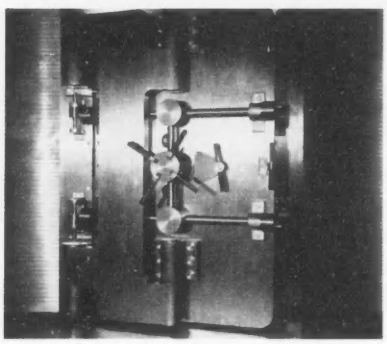

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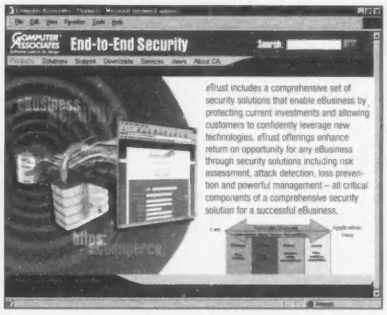

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Suspects potential Trojan horses, common trapdoors from hasty Y2k repairs

PATRICK THIBODEAU
WASHINGTON

THE FEDERAL government intends to make finding Trojan horses and trapdoors on computer systems a "research priority," since the risk is one that some companies may be facing as a result of hasty year 2000 repair work.

That was the message delivered by Richard Clarke, national coordinator for security, infrastructure protection and counterterrorism, at a U.S. Commerce Department-sponsored conference on information security last week.

Clarke said many companies "woke up too late" to the Y2k problem and in the process of doing "quick work" may have allowed malicious code to be implanted in their systems.

A Trojan horse can be as little as two lines of code buried in millions of lines of programming, said Clarke. "Even our best people have difficulty finding a Trojan horse or trapdoor," he said. Trapdoors can be used to gain unauthorized access into a system.

The Clinton administration is seeking $1 billion for information security research and development projects in next year's budget and intends to coordinate its efforts with those of the private sector "so we won't be duplicating what the corporations and the [information technology] industry will be doing on their own," said Clarke.

THE ASSOCIATED PRESS

NATIONAL SECURITY coordinator Richard Clarke assures that security research is a priority

The security conference was aimed at corporate board members and auditors — the people who oversee information technology management — to improve information security so as to avoid the risk of damage to the national economy. The conference was held with the help of several professional auditing organizations.

Auditors are being targeted by U.S. officials to help raise information security awareness because of their unique roles in corporations: They interact with the companies' boards of directors and can question whether an enterprise is addressing its information security issues.

"We can cajole the private sector to do the right thing. You can actually scare them to do the right thing," said John Podesta, White House chief of staff, at the first of a series of six conferences aimed at top corporate management. The conferences are being sponsored by the U.S. Commerce Critical Infrastructure Assurance Office.

Podesta also said any solutions to information security problems must be addressed by the private sector. Regulation, which is widely opposed by industry trade groups, won't work, he said. "Our policy is to support industry, not to overregulate it."

Chips Keep Tabs on Runners

But fail to match the human eye

BY JENNIFER DiSABATINO

When Fatuma Roba's foot slammed down on the finish mat in the Boston Marathon last week, a computer chip laced onto her sneaker recorded her finish time as exactly the same as Irina Bogacheva's. So judges turned to videotape to conclude that Bogacheva's torso crossed the finish mat first, giving Bogacheva the second-place slot, ahead of Roba.

In fact, the same thing happened among the top three finishers in both the men's and women's races.

So in the end, although the marathon's organizer, the Boston Athletic Association (BAA), used the most up-to-date technology, the human eye decided the day's dramatic finishes in the 104th running of the marathon.

Still, the chips provided family members, the media and doctors with quick access to information on the runners along the way.

"That could not have come together without the Internet services we provided," said Jonathan Cohen, a spokesman for Great Neck, N.Y.-based AppliedTheory Corp., which, with San Jose-based Cisco Systems Inc., provided the Internet connectivity that allowed runners' whereabouts to be tracked during the race.

The BAA has used computer chips to time runners since 1996, when the race attracted a record 38,000 entrants. The chip, manufactured by ChampionChip BV in Nijmegen, Netherlands, was first used in a major race in the 1994 Berlin Marathon.

This year, there were 17,813 runners and 65 entrants in the wheelchair division and handcycle exhibition. Each was assigned a black chip that corresponded to his bib number. Mats along the race course read the chips as the participants went by, sending the data to the marathon's intranet and then to its public Web site.

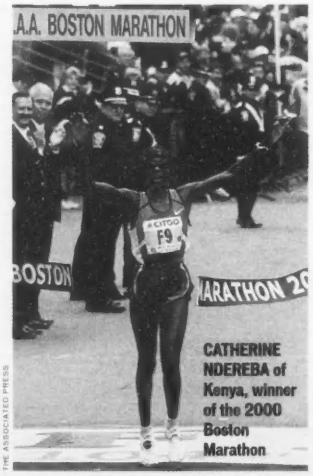
The chips also stored medical information about the entrants. Each time a runner came in for medical treatment, his visit and vital statistics were available for family and friends to view on terminals at spectator kiosks.

Phil Graceffa, the BAA's race technology coordinator, said the flow of data to the Internet was "seamless."

"In one case, someone's chip must have fallen off, but [he] still got [his] time because [he] was one of the leaders," Cohen said.

Marathon officials said there was a problem with the transmission of data at the 15-kilometer mark. That glitch was due to noise on the phone lines. "Both phone lines were so dirty that we had trouble transmitting via modem," Graceffa said. "The odds were probably against us that something was going to happen. We didn't lose anything; we just couldn't present it in real time."

DiSabatino is a freelance writer in Lynn, Mass.



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CATHERINE NDEREBA of Kenya, winner of the 2000 Boston Marathon

HP Touts Imaging Services

BY MARK HALL
SAN FRANCISCO

Odd as it may sound, Hewlett-Packard Co.'s CEO said she thinks printers are boring.

"That simple beige box is not really exciting," Carly Fiorina told an audience at an HP event here last week. Even after shipping more than 150 million boxes, she said, the company can make a lot more money in more interesting ways through building an infrastructure for printing and imaging services for information technologists and consumers.

For example, Federal Express Corp. in Memphis recently announced that its FedEx interNetShip service can now print shipping labels on low-cost ink-jet printers, whereas such labels were previously restricted to more expensive laser machines.

Karen Rogers, managing director of the FedEx Express Web site, which delivers the service, said, "These printers are everywhere. Every business has them."

Rogers said that the service grew more than 250% in the past year and that in February, the company issued 2 million shipping labels on laser printers, primarily at corporate sites. She didn't speculate on how the ink-jet devices would affect demand.

Although the FedEx service can use competitors' products, such as Torrance, Calif.-based Epson America Inc.'s printers, "HP is our printer of choice," said Rogers.

"Carly is saying that HP has to move away from a product focus to an Internet focus," said Marco Boer, an analyst at IT Strategies Inc. in Hanover, Mass.

Boer said HP is building an infrastructure that relies less and less on the PC, which could be trouble for Microsoft Corp. and Novell Inc., whose network operating systems lack the sophisticated output-management capabilities HP is designing into its new Internet products.

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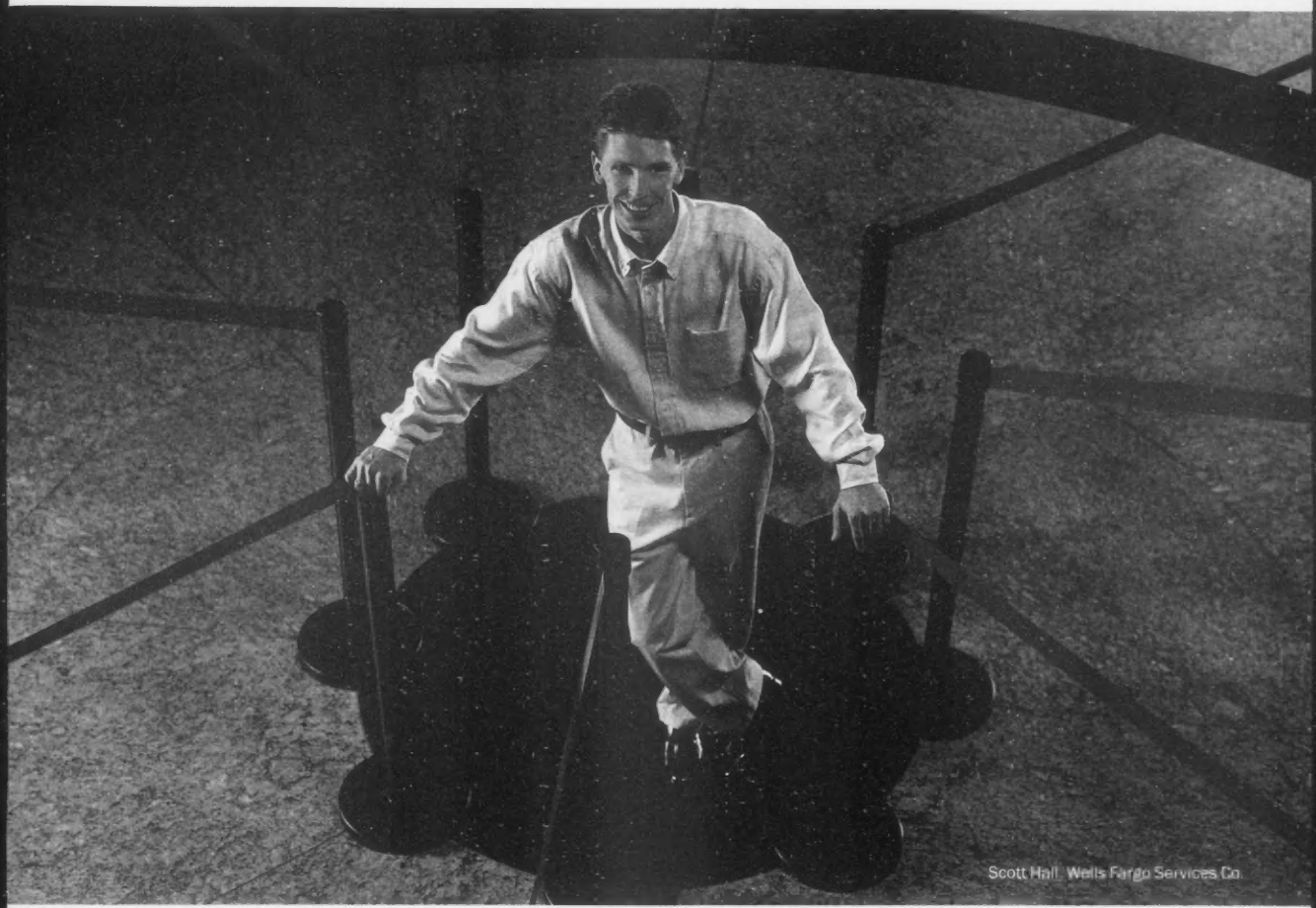

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Companies Skittish About SAP AG's Retail Application

After customization help from vendor, users hope to reap product's benefits

BY CRAIG STEDMAN

JO-ANN STORES INC., a $1.4 billion chain of fabric and craft stores, has started running its back-office operations on a retail version of SAP R/3 — making it just the sixth U.S. user to go live with the software.

Les Duncan, CIO at Jo-Ann Stores, said the Hudson, Ohio-based chain turned on SAP Retail in March and is now using the product to process 2 million sales transactions from its more than 1,000 stores each day.

But the $30 million project wasn't a simple matter. Jo-Ann Stores originally hoped to start using the retail applications last August, but Duncan said the schedule had to be changed because of performance problems with the software and the onset of the holiday season.

He added that the retailer also had to do custom development, with help from SAP, "to fill some big gaps" in the software's ability to keep track of seasonal products and manage pricing and promotions.

Jo-Ann Stores isn't the only user that's still finding functional holes in SAP Retail, which became available in the U.S. three years ago.

John Atkins, vice president of information technology at Tractor Supply Co. in Nashville, said the 280-store farming supplies chain has had to enlist SAP's help to design a series of work-arounds since it began using an earlier SAP Retail release a year ago.

"Things are smoothing out, and we're beginning to see the light at the end of the tunnel," Atkins said. But he added that Tractor Supply is holding off on an upgrade until it sees more users successfully going live with the current version of the retail software.

Dave Boulanger, an analyst at AMR Research Inc. in Boston, said SAP has stabilized SAP Retail's performance and signed up some "marquee accounts" such as The Home Depot Inc. in Atlanta and OfficeMax Inc. in Shaker Heights, Ohio.

SAP Retail Users:

- Jo-Ann Stores
- Tractor Supply
- Home Depot
- OfficeMax
- Petsmart
- Reebok International

But from a functional perspective, SAP is still trying to catch up to retail-oriented application vendors such as Minneapolis-based Retek Inc., Boulanger said. Key features like merchandise planning are still "fairly young" in SAP Retail, he noted.

In Jo-Ann Stores' case, Duncan said he had expected start-up problems as one of the first users to install SAP Retail. But the project still came in on budget, he said, and the company is now running most of its corporate-level retail operations on the software.

Sales data is uploaded from each store at night and transferred into the SAP system, which then handles tasks ranging from scheduling inventory replenishment to issuing purchase orders for new products. Only warehouse management and sales audits are still performed by other systems, Duncan said.

Jo-Ann Stores, which got consulting help from Burlington, Mass.-based Siemens Business Services LLC, replaced a half-dozen homegrown mainframe applications with the new system. Expected benefits include better inventory accuracy and the elimination of manual processes for checking invoices and counting products at stores, Duncan said.

He added that the earlier performance problems have been resolved by SAP — a fix that Jo-Ann Stores made sure was in place by running tests in which full daily loads of sales transactions were processed by the new software. That process was completed in February, prior to going live.

Widespread Use

Other users that are now running SAP Retail in the U.S. include PetSmart Inc. in Phoenix and Reebok International Ltd. in Stoughton, Mass.

SAP executives weren't available to comment in detail on SAP Retail. But the German vendor said more than 200 companies worldwide have bought the applications.

An SAP spokeswoman added that the seasonal-allocation capabilities developed by Jo-Ann Stores have been built into the latest version of SAP Retail. Other work done for Jo-Ann Stores will be included in future releases, she said.

Tax Sites Slow Due to Last-Minute Filers

IRS also affected by flood of latecomers

BY LINDA ROSENCRANCE

Another tax season has come and gone, and this year's was the most electronic to date. And although most people were able to access the various tax-related Web sites, it took them longer to do so as the filing deadline approached, according to Service Metrics Inc., a Web-site performance measurement firm in Boulder, Colo.

Service Metrics said that at least 98% of all visitors who visited the Web's 13 most popular tax sites between April 7 and midnight April 17 were able to access those sites.

However, the difference in time that it took filers to download the home pages of the various tax sites varied widely, from a fast 1.8 seconds at the Yahoo Tax Center Web site to a much slower 7.98 seconds at H&R Block Inc.'s TaxCut site.

A TaxCut software package is offered by H&R Block to customers who experience delays at its primary tax site and want to download the software to their PCs.

From April 7 to midnight on April 16, Service Metrics said, it took 6.45 seconds to download H&R Block's home page, but 8.67 seconds for the period from April 7 to midnight April 17, indicating that as the deadline to file federal taxes loomed, more people hopped online to access the site.

Linda McDougall, a spokeswoman at Kansas City, Mo.-based H&R Block, said 6 seconds didn't seem very slow and questioned whether the sites monitored by Service Metrics offered the same information at their Web sites.

"It all depends what you have to download," she said. "I don't know if we're comparing apples and oranges or apples and apples."

Service Metrics spokeswoman Deborah Jones said having more information to be downloaded is part of what slows down sites. "We measure how long it takes to download the Web page as a whole and then how long it takes each element, like a graphic, to download," she said.

Jones said the sites that load the slowest could learn from the sites that load the quickest.

"The [fast sites] know that customers aren't going to stay around and wait 6 seconds for a site to load, so they don't offer large graphics," she said. "These [quick-loading] sites have figured out how to streamline their sites."

Over at the Internal Revenue Service, through midnight April 17, it took visitors 7.05 seconds — up from the 5.34 seconds it took from April 7 to midnight April 16 — to download the home page and 4.82 seconds — up from 3.55 seconds — to download tax forms. Service Metrics said 98% of all visitors could access the site.

William Quinn, a Service Metrics spokesman, explained the high availability. "These sites have been doing this for a couple years and have been able to work out any bugs" they may have had, he said. "In addition, there aren't hundreds of millions of people hitting these sites all at one time, like there were at Christmas" which caused sites to slow down or crash completely.

An IRS spokesman said that on April 17 its Web site had 41 million hits — more hits than it recorded during the weeks of Jan. 3 to 9 and March 6 to 12, when it recorded 40 million hits each week, and Jan. 17 to 23, when it recorded 38 million hits.

Tax Preparation Web Site Performance

WEB SITE	PERFORMANCE (DOWNLOAD TIME IN SECONDS)	AVAILABILITY
SecureTax	2.82	99%
Yahoo Tax Center	1.8	99%
1040.com	3.4	99%
TaxCut	7.98	98%
H&R Block Tax Center	8.67	98%
TurboTax	4.71	99%
Quicken Taxes	4.04	98%
CNet Tax Software	5.39	98%
IRS Tax Center	7.05	98%
IRS Tax Forms	4.82	98%

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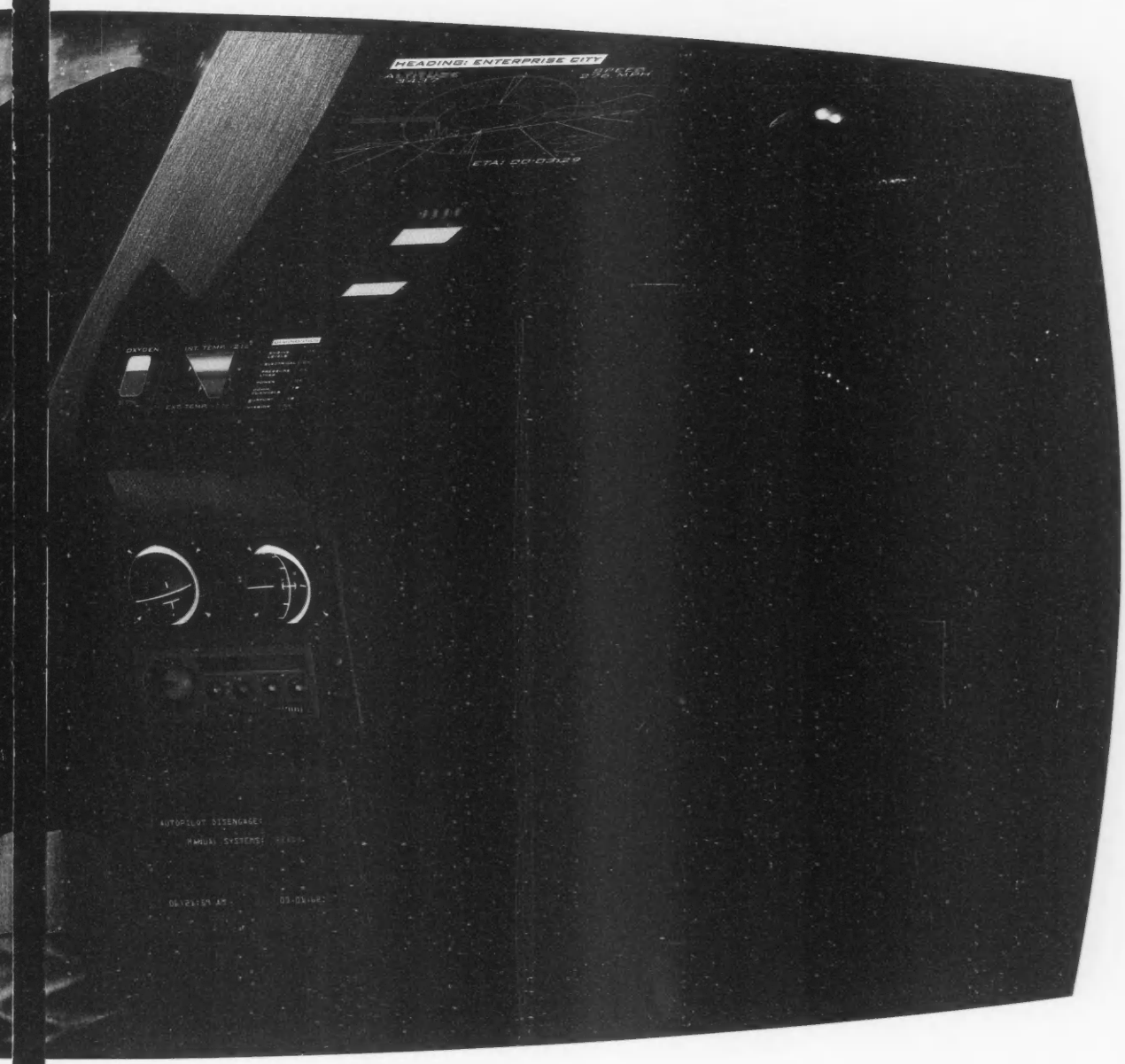

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Microsoft's Nielsen Describes World of Web Services

Also addresses company's lessons from Linux

BY DOMINIQUE DECKMYN

Taking over a slot generally reserved for his company's chairman, Bill Gates, Microsoft Corp.'s Tod Nielsen last week delivered the opening address at the Comdex/Spring '00 conference in Chicago. Later, Nielsen, vice president of Microsoft's platform group, spoke to *Computerworld* about the industry's move toward Web services.

MICROSOFT'S Tod Nielsen: "Linux is certainly something we pay attention to"

Q: I counted three Linux jokes in your keynote speech. Does that mean Linux is the main competitor on your radar screen?

A: I wouldn't say the main competitor. I think Linux is certainly something we pay attention to. My background in Microsoft is [in] working with the developer community, and so anything that gets the developer community's interest, I want to understand.

Q: From your perspective, what is the Linux value proposition and how can you respond?

A: It isn't what people commonly think, [that it's] because it's open-source and you can work on the source. It's rare to find a developer who makes any source changes to the Linux code. What they like is its suitability to [certain] tasks. You don't see them using a rich set of services building a rich set of applications. But if they want to have a fast, simple Web server or a special embedded appliance, and they want a simple operating system, it does that task pretty well. And it's Unix-based, so people who have the Unix bent are comfortable using it.

Q: Will Windows 2000 developers and resellers get the same flexibility to configure devices with just parts of the system they need?

A: What we don't want to see happen is fragmentation. We don't want someone's code to break when it moves from one machine to the other. We want the Windows experience to be a positive, valuable, reliable one. So we probably won't allow willy-nilly modifications. But that said, we're going to make sure that we provide the best technology for the task, and that developers will have the choice to install various components.

Q: What does the concept of Web services mean to Microsoft?

A: This idea that the Web will become a provider of core services that can be used by consumers or developers in applications is going to be key to the Web's next level of growth — so it doesn't just stagnate. I think it's a huge opportunity. But in order to realize that opportunity, you need an integration technology.

Going forward, the next generation isn't going to be about building a dot-com but about connecting the dots — how you bring them all together over this core XML framework.

Q: What's the difference between these Web services and the Next Generation Windows services that Bill Gates has talked about?

A: We think our platform will be the best place to build these services. But today you can go to any Web site — you can go to Sun.com and stick an XML interface on one of their applications, and it can be [called] a Web service. So it doesn't have to be Windows in order to be a Web service. ◗

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Microsoft Boosts Worker Benefits

Unlimited vacation time could spark IT trend

BY JULEKHA DASH

Microsoft Corp. may have fanned the flames in an already heated war for talent in the high-tech industry.

Some recruiting and retention experts said the company's decision to offer unlimited vacation time to senior-level employees could prompt other high-tech employers to do the same.

Last week Microsoft confirmed that it rewarded some employees with a broad range of incentives. It's granting some executives and software engineers as many as 200,000 shares of stock, promoting 30 managers to vice president and giving unlimited vacation time to top executives.

AT A GLANCE

Incentives

Microsoft's new benefits for some employees include:

- Increased stock options
- Promotion to vice president for 30 managers
- Unlimited vacation time

The vacation perk raised the most eyebrows among industry observers. Offering unlimited vacation time could "fundamentally change the landscape of benefits," said Dudley Brown, managing director at recruiting firm BridgeGate LLC, based in Irvine, Calif.

Analysts were skeptical that any senior staff at Microsoft could take more time off. "It's probably career suicide to take advantage of it," said Kazim Isfahani, an analyst at Giga Information Group Inc. in Norwalk, Conn.

While Brown agreed that most Microsoft executives couldn't afford to take vacation time, he suggested that the move could create pressure for companies to offer the same perk. "People at least like to have the sense that they can do what they want," he said.

Kevin Holt, vice president of human resources at Predictive Systems Inc., a New York-based networking consulting and integration firm, also said that Microsoft's competitors may follow its lead in offering unlimited time off to senior employees.

"No technology company can be the only one not offering a certain benefit," said Holt.

Brown said the enhancements may be part of an internal public relations effort stemming from the U.S. Department of Justice's antitrust case against Microsoft.

"I'd be doing everything I could to keep everyone because Judge Jackson's findings were pretty harsh," he said.

A Microsoft spokeswoman said the incentives aren't related to the case.

"Microsoft is constantly looking at ways to make sure it is competitive," said the spokeswoman. She said some of the promotions were part of a restructuring [News, March 31].

Microsoft's benefits could help it compete against start-ups, said Howard Rubin, a research fellow at Meta Group Inc. in Stamford, Conn. "Maybe their population is aging a bit," said Rubin. ◗

Dominique Deckmyn contributed to this report.

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Windows 2000

What is Windows 2000 Advantage?

Windows 2000 Advantage is the partnership among Microsoft, Compaq and Computerworld Enterprise Business Solutions to inform IT leaders about Windows NT and Windows 2000 technology by providing timely, useful information — in print and online — for planning and deploying Windows NT and Windows 2000 with Compaq services and solutions.

Online This Week

Windows NT: Still alive and well

Windows 2000 has been hailed by Microsoft as a must-have upgrade from its predecessor, Windows NT 4.0. With the flurry of activity surrounding the recently-released Windows 2000, NT users are wondering what the future holds in store for them. Should they upgrade, wait for NT's next iteration or just stay put? Read our story for the answers.

The vital Exchange 2000 Link: Active Directory Connector

A link is required between the Exchange 5.5 Directory Store and the Active Directory to enable users attached to the different versions to communicate with one another. This link is accomplished using the Active Directory Connector.

Microsoft Windows exec on working with Compaq and marketing Windows 2000

Deborah Willingham, Microsoft's vice president of human resources and formerly vice president of marketing for its Windows division, has a lot to say about working with Compaq, migrating users from Windows NT to Windows 2000 and the wealth of advantages the new operating system has for mobile users. In this interview, she discusses these topics and more.

Quickpoll **Will the enhanced security features in Windows 2000, such as PKI, IPSec and Kerberos, provide the state-of-art security to meet your particular needs?**

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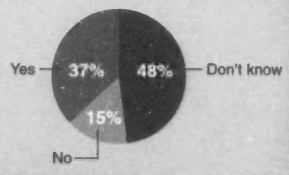

Microsoft

Compaq ProLiant-based Windows 2000 system smashes benchmark record

By Jacqueline Emigh

Compaq's newly announced "eGeneration" Internet processing strategy got a big boost last month when a potent, 12-node Compaq ProLiant 8500-based system running Windows 2000 and SQL Server 2000 Enterprise obliterated the former TPC-C benchmark test record by some 67%, processing more than 227,000 transactions per minute. The old mark was held by IBM's RS/6000 four-node cluster. Compaq's 8-node cluster also distinguished itself by processing more than 152,000 orders per minute

TPC-C measures a system's performance on a mix of five types of concurrent transactions. These include new order, payment, delivery, order status and stock level transactions.

Compaq's price/performance was also unparalleled, as the record-breaking system registered a rating of $19.12 per tpm-C, a score 2.5 times greater than the closest runner-up. The tpm-C metric measures only the number of new order transactions executed by the system per minute. The reason for this is that new orders constitute the most frequent type of transaction in the real world. They also represent the most complex transactions.

In order to determine the price/performance number, the price of the entire system is divided by the tpm-C metric. For example, if the price of a system is $859,100, and the tpm-C metric equals 1,562 per tpm-C, the price/performance number equals $550 per tpm-C.

Speaking at the recent Windows 2000 launch, Microsoft Chairman Bill Gates said of the new TPC-C champion, "It could handle all the e-commerce done on the Web during the last year in two days."

eGeneration is based on a three-phase strategy that leverages Windows 2000 and Compaq's dedication to meeting the rapidly expanding needs of e-business customers who must support massive numbers of users simultaneously accessing huge amounts of data.

Phase 1 began with the launch of Compaq's 8-processor ProLiant servers in August 1999. This phase also included the incorporation of leading-edge technologies such as multiterabye storage, hot-plug capabilities and lights-out remote management capabilities.

"This is more than just a cool benchmark. It's a major proof point for an architecture that will successfully address the dot com phenomenon," predicted Compaq's Vince Gayman, director of marketing for the High Availability Business Segment.

While Gayman says not every company is ready yet for the record-breaking 12-node cluster – which consists of 96 Pentium III Xeon processors working at 550 MHz – he notes, "There are many customers that will be facing demanding TP requirements. For some companies, Web site traffic for the 2000 Christmas season is projected to be three times higher than last season's. And you don't necessarily have to buy a big architecture right away. We've now demonstrated that, even if you start with a smaller system, you'll be able to scale out as far as you need to go." ◗

For the full text of this story, visit **www.Windows2000Advantage.com.**

ADVANTAGE

The Web Magazine for IT Leaders Implementing Windows NT and Windows 2000 with Compaq Services and Solutions

▶ **Case study**

VirtualBank leading online banking with Windows 2000/ProLiant combination

By Nora Isaacs

In the financial sector, security and speed are everything. The decision-makers at VirtualBank, a Florida-based Internet banking company, knew that if they didn't have these key elements they were in trouble. Using Compaq's ProLiant servers, the bank recently migrated its critical applications from a Windows NT platform to Windows 2000. The move brought with it not only enhanced security and speed, but also improved scalability and performance – all of the essential elements for becoming an industry leader in online banking.

"The platform you choose is a huge decision for any new Internet company," says VirtualBank CEO Rory Brown. "It's our single largest capital outlay. Windows 2000 has the same reliability and scalability as other platforms at half the cost. Choosing it was an easy decision."

VirtualBank's technology allows consumers to have access to all their financial accounts and transactions online via a single interface 24 hours a day, seven days a week. The desire to provide such rapid, secure, accessible and personalized service has driven the bank toward Windows 2000.

This migration began in earnest last December, when VirtualBank decided to test Windows 2000 to see if it would deliver the kind of enhanced performance they wanted. After running Windows 2000AS RC1 and RC2 in a test environment parallel with NT 4.0 server, the bank found that Windows 2000 is significantly more stable. They also discovered that Windows 2000 allows them to service more customers without enhancing the hardware. Another benefit includes the ability to reduce bottlenecks by scaling up.

Windows 2000 also provides VirtualBank with high Web server availability and the flexibility to add servers to the network for purposes of load balancing. In addition, Windows 2000 delivers a noticeably faster performance and was easily integrated into the Kerberos security scheme, an Internet standard.

Given its intent to implement Windows 2000, the bank's decision to go with Compaq was an easy one for this up-and-coming financial player.

"Compaq brings the most advanced Intel-based servers available on the market," says John Studdard, chief technology officer at VirtualBank. "The combination of power and modularity in ProLiant servers allows us to instantly adapt to changing server requirements. ProLiant comes in a wide array of configurations from commodity-based web servers up to 8-way Enterprise Mission Critical servers." ◗

For the full text of story, visit **www.Windows2000-Advantage.com.**

Point of View

Windows 2000 Terminal Services provides flexible, server-based computing

By Robert Williams

One of the significant benefits of Windows 2000 Server versions is the inclusion of a greatly enhanced Terminal Services capability. This technology permits the Windows 2000 desktop and applications to be used on a wide variety of systems including Windows PCs, Windows-based Terminals, Windows CE devices and even non-Windows desktops.

"Terminal Services is an important complementary technology for the enterprise," states Microsoft spokesman David Hamilton. "It expands the distributed computing model by providing a powerful server-based computing environment. All data processing, storage and application execution is done on the server. This provides greater flexibility in the deployment of applications to Windows and non-Windows desktops alike. Terminal Services also provides the added benefit of server remote administration."

Terminal Services is Microsoft's solution for server-based computing support. It represents a significant departure from the default Windows 2000 environment that assumes the user is operating from a self-contained computer system. Otherwise known as a fat client, this type of system is responsible for application processing, local storage and management of the Win32 user interface.

With Terminal Services, all processing is remotely performed on the server. It relies on server-based computing through the use of terminals, Windows CE devices or PCs for data input. The Win32 user interface is passed to the thin client where it is locally displayed. As keystrokes and mouse clicks are entered, they are sent to the server for interruption and execution. The server then refreshes the local "terminal" screen.

Terminal Services can be used in two different modes: for remote administration or as an application server. When enabling Terminal Services, you are prompted to select between application server mode and remote administration mode. ◗

For the full text visit **www.Windows2000-Advantage.com.**

For more inside, hands-on Windows 2000 information, go to www.Windows2000Advantage.com

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BRIEFS

Siebel Auction Deal

Siebel Systems Inc. in San Mateo, Calif., last week announced that it will acquire OpenSite Technologies Inc., a Research Triangle Park, N.C.-based maker of online auction software. The deal, which will involve a stock swap estimated at $444 million, will add dynamic pricing capabilities to Siebel's e-commerce software offerings, the company said in a statement. Siebel makes software that manages and automates companies' sales, customer relations and call center operations.

Inktomi Boasts First Profitable Quarter

Inktomi Corp. beat analyst predictions by reporting its first quarterly profit in its second fiscal quarter, which ended March 31. The Foster City, Calif.-based, maker of Internet search software and technology that helps speed Web browsing last week reported revenue for the second quarter of $47.3 million, up 211% from $15.2 million in the same period a year earlier.

Bluecurve Purchased

Linux vendor Red Hat Inc. last week announced a definitive agreement to acquire privately held Internet performance management software and services provider Bluecurve Inc. in an all-stock deal valued at approximately $37 million. The addition of Web-based performance management software from Oakland, Calif.-based Bluecurve will improve Durham, N.C.-based Red Hat's capabilities to help businesses proactively manage their Internet infrastructures, Red Hat said.

Stratus Win 2k Server Offers Fault Tolerance

Stratus Computer Inc. last week announced a new line of fault-tolerant Windows 2000 servers.

The new Stratus ftServer promises more than 99.999% availability at prices that start at just over $23,000, said Steve Kiely, CEO of the Maynard, Mass., company. That's at least 80% less than the previous price for Stratus' entry-level, Unix-based fault-tolerant computers, Kiely said.

Online Auctions Fuel Software Piracy

Web-based auctions could do more to curb counterfeit sales, group says

BY LEE COPELAND

THE SOFTWARE & Information Industry Association (SIIA) claimed in a recent report that a great deal of counterfeit software is being sold at online auction sites but simple remedies could curb the problem.

The SIIA conducted a review of online software sales on auction sites — including those of Amazon.com Inc. in Seattle, eBay Inc. in San Jose, Excite Inc. in Redwood City, Calif., and Yahoo Inc. in Santa Clara, Calif. — during a four-day period at the end of March and the beginning of this month.

The Washington-based organization found that 91% of the software auctioned was sold illegally. Of the 1,300 online software transactions it monitored, only 138 involved products that contained legitimate software licenses.

A similar review conducted on some of the same auction sites last August turned up a 60% software piracy rate.

Analyst Andrew Bartels at Giga Information Group Inc. in Cambridge, Mass., said auctions provide a new medium through which counterfeiters can sell illegitimate software.

"The issue with auction sites is that they create another venue — a more fluid, slippery venue — for someone to do this," Bartels said.

Easy to Remain Anonymous

"Online auctions may increase the potential risk of counterfeit sales because there now is a marketplace where sellers can extract value in a semianonymous fashion," Bartels explained. "It's much easier to sell counterfeit software online than [to stand] outside of a store in a black trench coat saying, 'Do you want to buy the latest copy of Microsoft Office?' "

Peter Beruk, vice president of antipiracy programs at the SIIA, said the auctioneers can dramatically reduce pirated software sales on their sites by proactively monitoring the auctions. He suggested that auction sites bar sellers from using terms like *backup*, *CD-R*, or *compilation CD* when describing software for auction.

"Pirates are lazy and will go where it's easy to sell products," he said.

Amazon's OK

According to the SIIA, Amazon.com monitors sales closely and immediately removes offending goods from its site. The SIIA didn't find any illegitimate software auctions on Amazon.com's Web site.

The SIIA suggests that consumers take common-sense precautions such as avoiding goods that carry labels such as *compilation CD*, which indicates that the software has been copied; ensuring that complete documentation is available; and watching out for extremely low pricing.

For example, SIIA officials found Corel Corp.'s WordPerfect Office 2000 selling for $14.95 on an auction site, whereas the suggested retail price is $299.95.

Shady Dealings

Signs that software may be illegitimate:

1. The terms *backup*, *CD-R*, *compilation CD*, *OEM*, *academic* and *not for resale* are used to describe the product.
2. The price seems too good to be true.
3. The product's documentation is incomplete.

Exec Exodus Hits Lotus

BY LEE COPELAND

Lotus Development Corp. confirmed last week that several top executives plan to leave in what the company called a "cyclical" wave of resignations.

The Cambridge, Mass.-based IBM subsidiary will soon lose its top development boss, John Throckmorton, executive vice president of worldwide development and support.

Last July, Lotus rearranged its organizational chart, placing Throckmorton in charge of Internet applications, communications and knowledge-management product development. His management team includes Brian Bell, senior vice president of knowledge management, who also plans to depart, and Jeanette Horan, vice president of communications product development.

At that time, officials said the reorganization was undertaken to meet operational and market goals and protect the company's lead in collaboration software. Lotus Notes/Domino and cc:Mail have been dominant in the e-mail market but have met increasing competitive pressure from Microsoft Corp.'s Exchange Server.

Lotus will also lose two top sales executives: James Feiger, executive vice president of worldwide field operations, and Mike Laginski, senior vice president of North America. Lotus officials wouldn't comment on the departures.

Executive Moves

Horan will take on the role of acting executive vice president of development. Pierre Van Beneden will relocate from Paris to Cambridge to head sales, officials confirmed.

In February, CEO Jeff Papows stepped down and Al Zollar, a 23-year IBM veteran, took his place.

Eileen Rudden, the company's senior vice president of communications products, has also left the company. Rudden had reported to Papows.

Lotus spokesman Paul LaBelle said last week there has been "no disruption at Lotus" as a result of the executive departures.

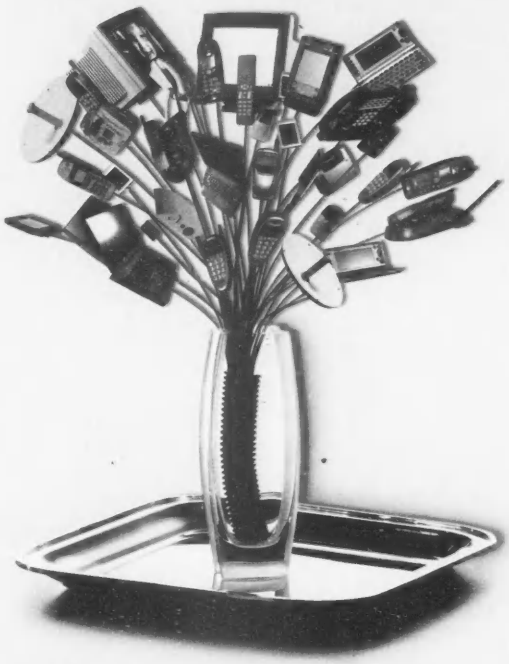
"We have a broad array of talented executives one layer below who are able to rise to the occasion," LaBelle said. He added that executive departures following a CEO change — as when Lotus co-founder Mitch Kapor left in 1986 and when his successor Jim Manzi resigned — are a "cyclical event" at Lotus.

SNAPSHOT

Quarterly Earnings Report

COMPANY	REVENUE Q1 2000	REVENUE PERCENT CHANGE*	NET INCOME (LOSS) Q1 2000	NET INCOME (LOSS) PERCENT CHANGE*
Apple Computer	$1.94B	27%	$160M	72%
EMC	$1.82B	23%	$332M	49%
Foundry Networks	$70M	335%	$18.1M	1,325%
IBM	$19.3B	4.8%	$1.5B	3.3%
Informix Software	$250.9M	10.3%	$27M	342%
Intel Corp.	$8B	13%	$3.1B**	52%
Lucent	$8.325B	26%	$754M	41%
Mapinfo	$23.47M	30%	$2.03M	92%
Rational Software	$180M	44%	$34.8M	65%
Sybase Inc.	$227M	9%	$19.5M**	129%
Symantec	$704.9M	33%	$187.2M	22%

* Compared with same period last year ** Excludes acquisition-related costs



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MARK HALL

More than money

A YIDDISH PROVERB observes, "With money in your pocket, you're wise, you're handsome and you sing well, too." The sweetest tunes in the computer industry have long been sung by the surprisingly handsome crew at Microsoft. But lately, Bill Gates and friends can't seem to carry a tune, and they're suddenly looking skanky, too.

First, Cisco Systems briefly slipped past Microsoft as the top tech company in market capitalization. Then, in the latest yo-yoing of the stock markets, Microsoft took a serious financial tumble, while archrival Sun Microsystems' equities held their ground.

MARK HALL is *Computerworld*'s West Coast bureau chief. You can contact him at **mark_hall@computerworld.com.**

A final indignity came last week in reports that suggest Larry Ellison might surpass Gates as the nation's richest person later this year. If you believe financial strength is important in choosing a vendor for enterprise technology, Microsoft is starting to look less attractive than it once did.

It isn't just money, either. Members of Microsoft's choir are beginning to look for new sheet music. Just last week, Carly Fiorina, CEO of one of the company's oldest and best partners, Hewlett-Packard, said she wants to "untether" printers from the PC. And Intel continues to push Linux hard — so much so that it has dropped Windows NT in favor of the open-source operating system for some of its own internal development work.

This current upheaval of the world as we know it may soon pass, allowing us to return to the calm clarity of one ruled from Redmond. Certainly, Microsoft has the ability to virtually mint money at will through software licenses. For now, as quarterly results released last week prove, it remains a dominant and financially strong giant in the industry. It has a slew of new products for IT to consider. Its Pocket PC technology has the look of a winner. Its upcoming Next Generation Windows Services is nearing delivery, and its data center version of Windows 2000 isn't far behind. Its competitors still shiver in its shadow. Lastly, it has more developers in its pocket than anyone else. That's real gold.

So perhaps we'll continue to listen to Microsoft's divas for some time to come. But they aren't looking nearly as pretty as they used to.

DON TAPSCOTT

Moving toward wireless devices? Run, don't walk!

WHEN I SPEAK with companies that are deploying portable wireless devices, their views are consistent: Going wireless is easier than expected, and the payback is large.

If you're holding off on using these products to see which devices triumph in the marketplace, my advice is: Don't. It doesn't matter whether your staff or customers end up using wireless Palms, Windows CE units, browser-equipped mobile phones, the snappy, new voice-activated MiPad (multimodal interactive notepad) technology that Bill Gates recently unveiled or some other gadget. The technology exists to service all these devices simultaneously.

DON TAPSCOTT is chairman of the Alliance for Converging Technologies (*www.actnet.com*) and co-author of *Digital Capital* (Harvard Business School Press, May 2000). Contact him at **dtapscott@actnet.com.**

Most of these devices will probably survive, since there's an enormous pent-up market for wireless connectivity.

Look at the soaring popularity of the revolutionary "i-mode" phone introduced in Japan only 14 months ago by NTT DoCoMo (*www.nttdocomo.com*). The product already serves more than 6 million happy customers, and that number will top 10 million by year's end.

Using packet technology, these svelte phones are constantly connected to the Internet. You don't have to log on to the Web, as you do in North America. The display screen is the size of a business card, and color screens are available. More than 350 companies have built a vast array of Web sites for the i-mode. Users can receive e-mail, chat, buy and sell securities, download video or songs, swap photos, read train schedules, look up horoscopes, check movie listings and more. The Japanese are hooked.

Sadly, it will be at least a couple of years before the i-mode's constant connectivity feature is available on phones on this continent. But this is no reason to delay adopting wireless technology, since the capability of wireless devices in North America is already impressive.

SAP AG, for example, is adapting the MySAP.com Web page so that it can be viewed on the screens of Web-browser phones. Each corporate user customizes the screen to make available the information he feels is appropriate — usually time-critical information such as order his-

tory and product and pricing information.

So before visiting a customer, a salesman can call up the status of the customer's account on the phone's screen. He can review the most recent orders and see if any deliveries are outstanding. He can even phone his company's loading dock to see what the problem is.

Sure, your salespeople could do the same thing with a laptop plugged into a regular mobile phone, but a mobile phone by itself is a lot cheaper. It costs less to buy, a lot less to maintain and much less to train employees in its use. If the information your field staff needs can be compressed onto a small screen, why pay for anything larger? Although they're still primitive, these devices are already proving their worth. ◗

ROBERT H. ROSEN

In growing global economy, boost cultural literacy

DURING THE PAST several years, I met with the CEOs of many of the world's top corporations to discuss what it will take to succeed in the global economy. I kept hearing the same message, and a critical lesson emerged: Culture will matter more, not less.

Contrary to conventional wisdom, technology isn't eliminating cultural barriers. While the ability to communicate with people far and wide at increasingly rapid speeds and in innovative ways may be breaking down geographic and economic barriers, cultural boundaries are holding fast.

This means that for the foreseeable future, cultural issues will complicate the global marketplace. American companies, blinded by their technological success, will be particularly susceptible to cultural difficulties. My recent research shows that valuing multicultural experience and developing leadership at all levels of an organization are the two best predictors of success in the global marketplace. Yet, in a survey of 1,200 senior business executives around the world that I conducted with Watson Wyatt Worldwide, U.S. executives were less likely than their foreign counterparts to say that multicultural experience matters.

ROBERT H. ROSEN, CEO of Healthy Companies International in Washington, is the author of *Global Literacies: Lessons on Business Leadership and National Cultures* (Simon & Schuster, February 2000).

Unless this changes, U.S. companies will be vulnerable. Businesses that fail to understand the importance of cultural differences and refuse to learn to speak the new global language will be blindsided by the rivals they underestimate.

The solution to this problem is to develop what I call "global literacies." Globally literate individuals and companies see the world's challenges and opportunities; think with an international mind-set; act with fresh, global-centered leadership behaviors; and mobilize people across national cultures.

Globally literate individuals possess four distinct competencies: personal literacy (understanding and valuing yourself), social literacy (engaging and challenging others), business literacy (focusing and mobilizing your organization) and cultural literacy (leveraging culture for competitive advantage).

These are the competencies every leader must practice. However, they will be expressed differently around the world, depending on where you live, work or conduct business.

Given the importance of global literacy in a technology-driven world, I recommend the following:

■ **Use technology in globally literate ways.** In a global marketplace, technology is the medium through which people conduct business. While technology accelerates and expands the pace and range of communication, it also increases the chances for miscommunication. Especially with technology through which you can't pick up on physical or emotional cues, you must read between the lines and listen deeply for the emotion, tone, context and cultural nuances in every communication.

■ **Learn from the best around the world.** Each part of the world excels in a different literacy area. Some Asian cultures, for example, teach us about personal literacy through their ability to understand paradox and ambiguity. Latin American cultures teach us about social literacy by modeling how to build relationships in less-organized, constantly changing environments. From European cultures, we learn cultural literacy based on centuries of working and living cross-culturally. In North America, we learn business literacy by building change-ready, technology-savvy, high-performance organizations in a results-oriented culture.

■ **Use culture as a tool for business success.** It's vital to understand how your culture influences how you relate to technology. Americans love new technology; they like quick action and excel at creating new things. They tend to abandon ideas that don't show a rapid return on investment. Other cultures react differently. The Japanese, for example, have been more comfortable with incremental improvements.

Adopting these strategies will start you on a path to global literacy. It's a long-term process, and the choice is yours: You can choose to get started, or you can choose to be left behind. ◗

READERS' LETTERS

Life, liberty and the pursuit of Internet freedom

ALEX TORRALBAS presents a very important concern about Internet service providers' potential censorship of users ["How the Net Endangers a Basic American Liberty," News Opinion, April 3]. His solution, "to ask our leaders to pass laws protecting our rights from arbitrary corporate censorship," isn't yet the best solution.

As we are all learning, to our eternal dread, government interference in technology, and with the Internet in particular, is and always will result in a permanent — and growing — drag on the e-environment. To avoid, or at least postpone, government legislative or regulatory involvement, the whole e-community's active self-regulation is required.

Specifically, the e-community must ensure that its members resist the ever-present urge to censor individual taste. We must act responsibly and accountably and take whatever steps are necessary, when they are necessary, to prohibit, stop and punish those who would attempt to impose their personal or corporate censorship philosophies upon those of us who must use their electronic road to the Internet.

If we then fail — well, perhaps it will become necessary to call in the "federales" to protect us from ourselves. Not a very pleasant thought.

Jim Bronson
Frankenmuth, Mich.
H_J_Bronson@compuserve.com

ALEX TORRALBAS' opinion that we can't allow corporate America to determine how we exercise our legal liberties hit a nerve.

There is a very disturbing association between government and business, and it's not limited to the funding of politicians.

The business of government is the welfare of its people, not its commerce or businesses. Application of the trickle-down theory showed most of us that eating peanuts isn't quite as good as eating porterhouse steaks.

I hold that allowing business to determine the extent and control of the Internet would once again provide us with peanuts and abrogate the business of government.

Daniel Mauro
Newport News, Va.

Microsoft simply reacted to lawsuit

THE ONLY bundled attachments I see Microsoft giving away are clones of other companies' innovative software ["Users Question Impact of Trial and Remedies," Page One, April 10].

I would like to see what Bill Gates' actions would be if someone were giving away a Windows 2000 clone bundled with a virus-detection package that cost $29.95.

The market changes came after the Department of Justice filed its lawsuit. No one believes that those changes would have occurred had the DOJ not filed the lawsuit.

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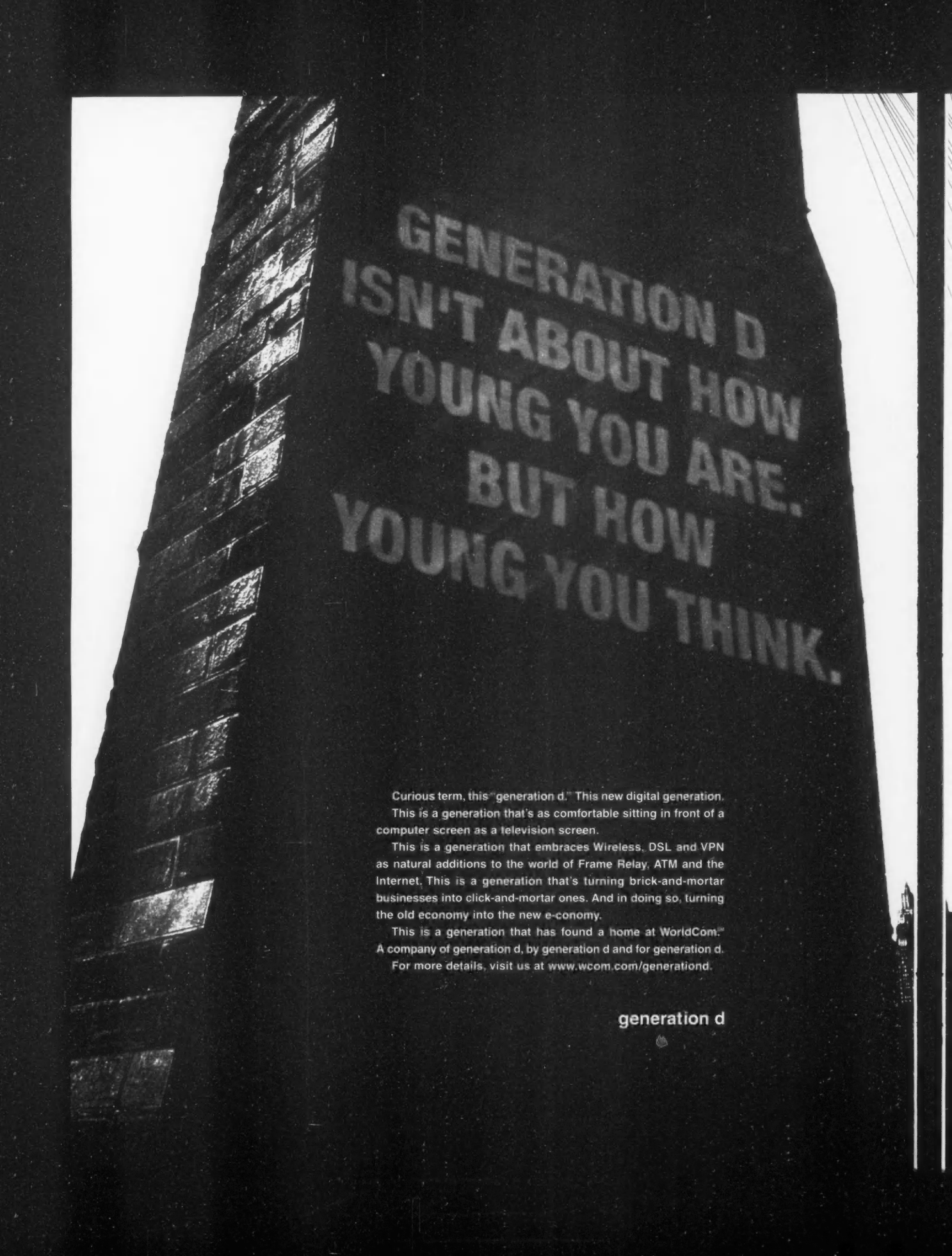
COMPUTERWORLD welcomes comments from its readers. Letters shouldn't exceed 200 words and should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.



Curious term, this "generation d." This new digital generation.

This is a generation that's as comfortable sitting in front of a computer screen as a television screen.

This is a generation that embraces Wireless, DSL and VPN as natural additions to the world of Frame Relay, ATM and the Internet. This is a generation that's turning brick-and-mortar businesses into click-and-mortar ones. And in doing so, turning the old economy into the new e-conomy.

This is a generation that has found a home at WorldCom.® A company of generation d, by generation d and for generation d.

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generation d

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GEOFFREY JAMES

Wanna keep your IT pros? Cut the management bull

GOOD LORD! According to a recent Associated Press story, even Microsoft is having trouble attracting top programmers, as the scarcity of IT talent reaches truly epic proportions. Statistics indicate there are well over 200,000 IT job openings in the U.S. but only about 25,000 new college graduates available each year to fill them.

Under the circumstances, most IT managers want to do everything possible to keep employees happy. Luckily, retention doesn't have to cost an arm and a leg because — contrary to popular belief — a high salary is overrated as an incentive to stay put. According to a recent study by management consulting firm Hewitt Associates, IT professionals are often motivated to stay simply because they enjoy their work.

GEOFFREY JAMES (*www.geoffreyjames.com*) is the author of *Success Secrets from Silicon Valley* (Times Books, 1998).

The study identified several job characteristics that keep the grass from looking greener elsewhere, including the opportunity to learn and use new technical skills, a positive work environment, the ability to start and finish a project and the ability to make decisions. This isn't brain surgery, folks. Everybody knows that creative technical people are happiest when their jobs are interesting and they have a bigger say in decisions that will affect them and their careers.

But there's another side to the equation. It isn't just the challenge that keeps top techies in their seats, it's the lack of the typical corporate bull.

While the Hewitt study revealed that a majority of IT professionals who leave their jobs do so for promotions, more than half also said a major factor in their decisions to leave was the work environment. To put it in plain business English: If you want to keep your best people, you've got to cut the bull.

There are thousands of real-world IT organizations that are being overmanaged to the point where it's a miracle anyone is still working at any of them. You know what I'm talking about: Projects with a manager, a project manager, a product manager, a supervisor, a systems architect and a couple of coders, both of whom are secretly polishing their résumés because they're sick of all these managers telling them what to do.

And how about companies that trot out a new management fad every year? As one IT professional put it: "We've been reorganized, restructured, re-engineered, rightsized, downsized, upsized, TQMed and MBOed, and if I hear the word *empowered* once more, I swear I'm gonna scream."

There are even some companies that still require engineers to wear ties. If you want to keep your IT staff happy, let them set their own hours, dress in whatever way they feel comfortable, decorate their work areas as creatively as they like and even play computer games, as long as they're delivering their projects on time and on budget.

Sure, it's a big change from the way things used to be. The employees have the upper hand, and I hardly know an IT manager who doesn't quake in his boots every time a key player makes a few disgruntled noises about hitting the road for greener pastures. It probably makes a few traditional managers wish for a return to the bad old days of high-tech-layoffs-aplenty, when the shoe was on the other foot. Dream on.

WILLIAM M. ULRICH

Web partnering may be a cure for IPO strategy

STEP INSIDE a typical e-business and you'll find executives seeking funding, working toward an initial public offering (IPO), courting analysts to bolster their stock price or plotting to sell the company. The demand to entice and impress investors has never been as widespread in the technology sector as it is now. But investors shouldn't drive your e-business strategy, particularly when it means a company is sacrificing customer value to satisfy investors.

WILLIAM M. ULRICH is a management consultant and president of Tactical Strategy Group Inc. Contact him at **tsginc@cruzio.com** or through **www.systemtransformation.com**

Investors might argue that what's good for them is good for the customer. But establishing a company where the goal is taking it public and turning over major profits for initial investors is very different from building a business based on a long-term, customer-focused vision. Consider the recent *Wall Street Journal* story about the plan by 14 oil and chemical giants to launch an electronic procurement exchange to reduce supply-chain expenditures. The creation of this exchange, which is open to any oil or chemical company, demonstrates how an industry can collectively leverage the Internet to radically reduce procurement costs. It also raises certain downstream concerns.

Controlling interest in this exchange is in the hands of 14 large corporations. Assuming this venture succeeds, what guarantees do future participants have that the founders won't dominate the exchange? Say, for example, that you run a small oil company that, along with thousands of other midsize companies, begins to purchase supplies through the exchange. As you dismantle existing supply-chain relationships and expand your use of the new exchange, major investors in the exchange gain significant leverage over you and other small companies. Although the article said no company would dominate the exchange, a small group of the founding members is likely to wield significant board-level control. The company could run up fees, limit supply-chain access, sell the operation or shut down the exchange.

This scenario leaves users of the exchange and their customers open to risks. But there's an alternative to the IPO strategy. The partnering companies could establish a member-owned organization like the one used to launch Visa in the late 1960s. No member or group of members can dominate Visa, and Visa can't be taken over because it's owned by the 22,000 financial institutions it serves. Most important, the primary focus of the member-owned enterprise is to serve all participants and customers equally, without the distractions inherent in an investor-driven operation. Building such an organization involves combining chaordic organizing disciplines [News Opinion, Feb. 21], pioneered by Visa founder Dee Hock, with the Unifying Systems Model (USM), created by organization development consultant Hina Pendel at US Partners in Santa Cruz, Calif. (Chaordic organizations effectively leverage order and chaos.)

In a member-owned organization, founding companies form a design team, draft a purpose and outline a set of principles under which the company will operate. The design team then creates an organizational framework and drafts a constitution forming a legal entity. The organization's design is based on USM hub structures where each hub organizes participants, suppliers and customers into functional or regional substructures. New hubs could form, based on a particular need in accordance with organizational principles. Centralized hubs serve as regional and corporate boards. A participating company could join the exchange by agreeing to and abiding by the constitution — and leave whenever it wishes. No company or small group of companies could dominate or take over this organization.

The member-owned concept isn't restricted to supply chains. Virtual marketplaces that sell or trade products and services, application service providers or other customer-driven enterprises could employ this business model.

IT leaders being asked to share information or costs with industry partners should promote the member-owned approach to ensure that a new e-business remains customer- and participant-focused and doesn't cater to investors' whims.

Given analysts' recent souring on technology stocks, this may be the best thing to happen to some of these organizations.

Technology *Brief*

▶ E-Business: Opportunity Today, Requirement Tomorrow

By Lynne Stockstad

THE UNPRECEDENTED power of the Internet to communicate is fundamentally changing how business is conducted. The change is known as "e-business," and today it represents a dramatic competitive advantage for those companies that either originate on the Internet as "dot.coms" or transform themselves from "bricks and mortar" to "clicks and mortar."

Lynne Stockstad is vice president of e-business at Great Plains

But soon, e-business will simply be a business requirement to thrive, if not survive, in an interconnected digital economy. A comprehensive e-business management solution that supports both the emerging computing paradigm and the transformation of business processes is critical to today's businesses.

In an e-business world, computing is shifting from the traditional client/server model to an "anywhere, anytime, by anyone" model. Therefore, e-business solutions must support secure access through multiple appliances, including network computers, handhelds, smart phones, smart cards, televisions and PCs.

Solutions must also leverage all the computing resources on the network — including the Internet — and must enable direct business-system-to-business-system exchanges through the use of Extensible Markup Language (XML), without any required user intervention.

The e-business computing paradigm enables the transformation of business processes, revolutionizing process steps, process participants and their roles. Comprehensive e-business solutions will deliver both process transformation breadth and depth.

A "breadth" e-business management solution encompasses all key processes within a business that can be generally grouped under the categories of Manage, Purchase, Sell and Service. In an e-business world, each category consists of content, interactions and transactions between a business and the constituents within its business community.

This community includes prospective and current employees, partners, customers, suppliers, influencers, press, analysts and shareholders. A breadth e-business management solution will transform business processes across all business community constituents.

A "depth" e-business management solution delivers end-to-end transformation within a specific business process. For example, a depth solution for the process of selling goods and services to prospective and existing customers would not only include a well-designed Web storefront, but also the seamless integration with the e-business back-office engine.

With the depth approach, changes such as item pricing, item availability, customer credit history or sales tax calculations can be seamlessly incorporated into the customer's Web shopping experience. Vendors that will emerge as leaders in e-business management solutions will need to deliver both breadth and depth business process transformation.

The delivery method for e-business solutions is also transforming radically. Within the software industry, this transformation is often thought of as a shift from "software as a product" to "software as a service." Delivering software as a service primarily affects pricing and deployment.

Under the service model, solutions are priced according to a monthly or annual subscription fee vs. an upfront lump sum and are deployed through a third-party data center host instead of the customer's internal network. Data center hosting providers, or application service providers, are building their value proposition around software as a service to dramatically reduce the expense of IT infrastructure and personnel.

These transformations will require dramatic change in the business management solutions that enable e-business. Today, there isn't a single e-business management vendor that can provide a comprehensive solution that supports the e-business computing paradigm, transforms business processes across breadth and depth and delivers software as a service.

However, the leading, traditional enterprisewide business management vendors are best positioned to offer comprehensive e-business solutions in the near term. Why? These vendors already deliver the most complex and critical component for e-business — transaction processing — and account for the transactions as well.

Today, e-business represents an opportunity for individual businesses and business management solution vendors. Tomorrow, however, e-business will be a requirement for both to survive — and ultimately thrive — in an e-business world. ▮

Integrating Customers Into Your E-Business World

Industry experts say that the cost of gaining a new customer is six to seven times more than the cost to retain an existing customer — that's a shocking figure.

Implementing a customer relationship management (CRM) solution provides a holistic corporate view of customer relationships and data that enables companies to better address their customers' needs and concerns.

With an integrated front- and back-office solution from a single source, not only can you have greater accuracy of data without duplication of entries, but you also can ensure consistent and successful support of the solution. This provides you with benefits across the board. Externally it allows you to improve customer value and satisfaction, get better customer response and create higher profitability. Internally it allows for a more seamless flow of information, reducing employee stress and creating a more productive work environment.

Creating and executing a successful CRM strategy will be essential for success as e-business becomes business as usual. ▮

GREAT PLAINS

Great Plains is a leading provider of integrated front office/back office e-business solutions for the midmarket. The company's award-winning products and services automate essential business functions and enhance the strategic value of financial and operational information.

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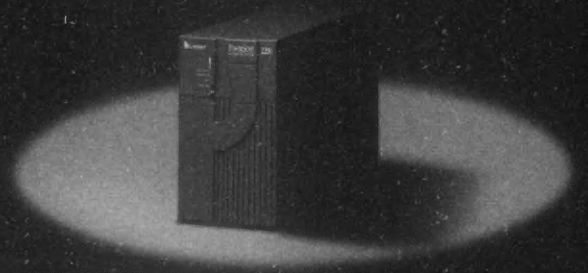

...now available in the handy, 12-minute back-up run-time pack.

Where did we get over 1,000,000 real-life hours MTBF? It sure wasn't in a lab. It was in the field. In fact, Frost & Sullivan, the global market research and consulting firm, recently released the results of a user survey which rated Liebert number one in UPS brand awareness, recommendation and use among Fortune 500 companies.

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BUSINESS

CLEANING HOUSE

GMAC, the financial services arm of auto giant General Motors, is getting rid of its old systems to make way for new, streamlined e-commerce business processes. The results, says CIO Linda Taggart, are greater efficiency and larger profits. ▸ 42

CHANGING OF THE GUARD

After 25 years at Federal Express, CIO Dennis Jones has announced that he will retire at year's end, clearing the way for Chief Technology Officer Robert B. Carter to fill his shoes. Jones, whom CEO Frederick W. Smith called FedEx's "visionary," spoke with *Computerworld* about his accomplishments and plans for the future. ▸ 42

SLOW TO GO PUBLIC

Not all information technology firms are swayed by the potential riches of an initial public offering. Some companies, like SAS Institute, have enough cash without going public, while others, such as InfoImage, want to steer clear of shareholder demands. But both InfoImage and SAS have finally given in and announced plans to go public. ▸ 44

WEAK LINK IN SUPPLY CHAIN?

The benchmarking guidelines developed by the Supply Chain Council are helping companies such as GM and Dow Corning increase the efficiency of their supply chains. But they're in the minority, as few companies seem to be implementing the guidelines. ▸ 46

PROVIDING TIME OFF FOR DAD

The controversy over whether British Prime Minister Tony Blair will take paternity leave has sparked an awakening among U.S. companies that don't offer time off for new fathers. And high-tech companies, desperate for an edge in the competition for talent, are taking the lead. ▸ 47

THE BEST JOBS

More than two-thirds of the IT workers questioned for *Computerworld*'s Annual Job Satisfaction Survey said they expect to leave their jobs within the next year. But it isn't about money and benefits. Workers said they want more training, responsibility and room to grow. ▸ 54

PATENT FRENZY?

As e-commerce grows, more companies are trying to patent the new business processes they create. But some say the new e-commerce patents cover too much territory, leaving other companies open to lawsuits for violations they don't even know they're committing. ▸ 58

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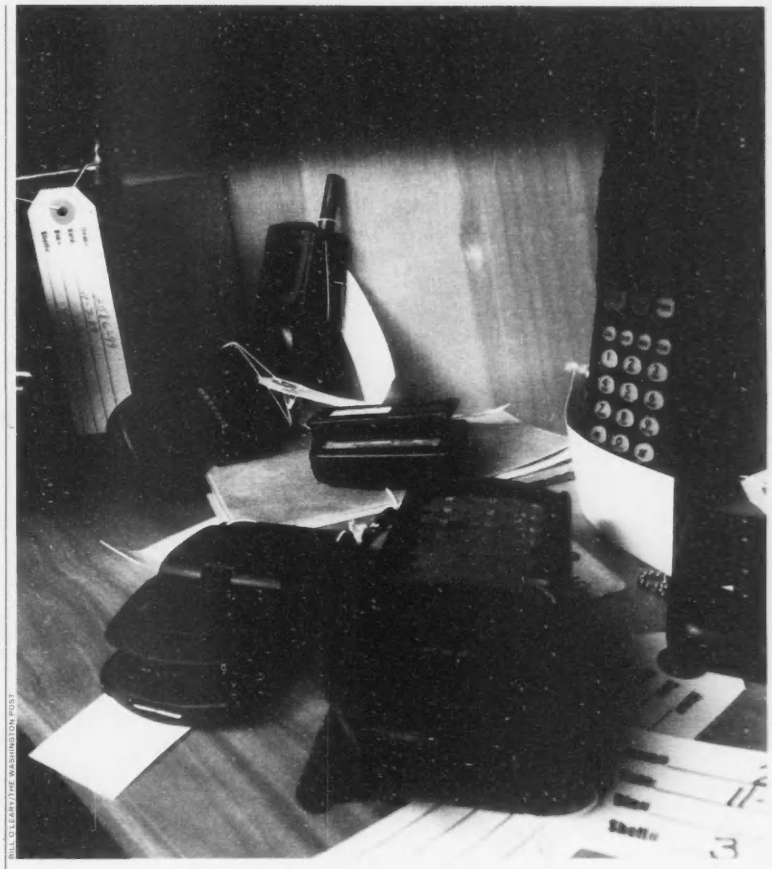

BILL O'LEARY/THE WASHINGTON POST

PORTABLE NIGHTMARES

ARE HANDHELDS JUST a little too convenient? As employees take personal digital assistants on the road, it's very easy to lose the devices, possibly letting sensitive corporate information slip into the wrong hands. The dilemma has prompted corporate security experts to take extra precautions to protect company secrets.

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E-Commerce Driving GMAC Streamlining Effort

GM could bolster its profits by revamping its financial services arm

BY LEE COPELAND

GENERAL MOTORS Acceptance Corp. (GMAC), the financial services arm of the world's largest automaker, is in the midst of some major housecleaning.

Gone is the hodgepodge of 62 internal and external Web sites that the financial services company maintained just 18 months ago. Gone are a number of legacy systems and paper-based business processes.

Gone, too, are many of the internal information technology staff members, who have been replaced by contractors.

Like the rest of General Motors Corp., Detroit-based GMAC is moving headlong into the world of e-commerce.

GM's initiatives include equipping its cars with satellite and cellular communication systems and building business-to-business exchanges with rivals Ford Motor Co. and DaimlerChrysler AG.

"The beauty of e-commerce is that it allows us to move faster while changing our legacy environment," said Linda Taggart, CIO at GMAC. "A lot of our systems were older, and historically, they grew up as art, not science."

Taggart hires experienced individuals for senior IT roles but uses contract staff elsewhere. These streamlining efforts are part of the company's plan to hone its IT endeavors while it launches new Web-based initiatives whenever it makes sense to do so.

LINDA TAGGART: E-commerce allows GMAC to move faster when making changes to IT systems

In one such initiative, GMAC is piloting SmartAuction, a Web auction site for selling formerly leased vehicles to dealers. Taggart said that project could save GM $500 million by cutting the cost of physically transferring vehicles and reducing purchase cycle times.

GMAC does more than provide financing to dealers on vehicle loans and leases. It's also the largest commercial mortgage banker in the U.S. The company is expanding its real-estate services portfolio and recently acquired an online mortgage company, Ditech.com in Costa Mesa, Calif.

GMAC posted net income of $1.5 billion on revenue of $20 billion last year. Those results represent significant pieces of GM's $156 billion in revenue and $4.5 billion in profit.

Hiro Mori, an analyst at Automotive Consulting Group Inc. in Ann Arbor, Mich., said GMAC is important to GM, and any efficiencies gained via e-commerce will significantly affect the parent company.

"The majority of [GM's] revenue comes from sales of automobiles," Mori said. "But the profit does not come from selling automobiles; it comes from financial services."

AT A GLANCE

GMAC Profits

- Last year, GMAC posted net income of $1.5 billion on revenue of $20 billion.
- In the first quarter of this year, GMAC reported profits of $397 million, a 1% increase over the first quarter of last year.

FedEx CIO to Retire This Year

IT veteran Robert Carter to fill role

BY LINDA ROSENCRANCE

When CIO Dennis H. Jones started at FedEx Corp., it was a 2-year-old, $30 million start-up.

Now, after 25 years with the $20 billion, Memphis-based global shipping giant, Jones plans to retire by year's end.

Jones, who agreed to stay on to help his successor, Chief Technology Officer Robert B. Carter, make the transition to CIO, said he will be looking for new challenges.

CIO DENNIS H. JONES will explore new options after 25 years at FedEx

"I'll probably be retired for half a nanosecond," said Jones, who is also FedEx's executive vice president of information technology. "I'm looking for a different challenge with a lot of breadth and depth to it. I have a lot of different options, but it remains to be seen in which direction I go."

Company officials said the shift won't affect its operations or customers.

"Dennis has been our IT visionary, placing us at the forefront of technological innovations and Internet business applications," said FedEx CEO Frederick W. Smith.

Jones began his career at FedEx in 1975 and ascended to CIO 10 years ago.

At that time, customers were tracking and tracing their shipped goods via free PCs and proprietary software provided by FedEx, a system later named FedEx PowerShip.

In 1994, FedEx launched its Web site and became the first shipping company to offer customers online package tracking.

The company also brought out two new products: FedEx Ship, a shipping and tracking software for Windows and Macintosh that is loaded directly onto customers' computers; and interNetShip, a Web-based shipping application.

"I'm proud of the leadership we have taken in the area of e-commerce and the way we have extended our IT capacity into the marketplace," Jones said.

Jones was also the driving force behind the development of the FedEx World Technology Center in Collierville, Tenn., home to the company's state-of-the art IT department.

John Fontanella, an analyst at AMR Research Inc. in Boston, said Jones is, in many ways, an IT pioneer. And he's the type of person who will do whatever it takes to get a job done — a trait that didn't always sit well with some of his colleagues, said Fontanella.

"He's a very forceful person, and some people in FedEx were unwilling to make the changes necessary to make FedEx a supply-chain management company," Fontanella explained.

Carter, 40, joined FedEx in 1993 and has more than 20 years of IT experience. As CTO for the past two and a half years, he has been responsible for technology strategy and for developing applications to make it easier for customers to do business with FedEx.

FedEx is working on creating a single point of access to its customer support functions, such as customer service, e-commerce, billing and automation, either online or via the telephone, said Carter.

"I'm already active in the transition phase — taking these new initiatives and bringing them to conclusion," he said.

SNAPSHOT

Business-to-Business Roundup

■ **Food Distributors International (FDI)** in Falls Church, Va., and the **Food Marketing Institute** in Washington, whose members conduct $800 million in annual business, announced last week that they are teaming up to build a business-to-business Internet exchange. The buying exchange will let members pool their purchasing power to get lower prices on nonconsumer goods such as office supplies, said an FDI spokesman, who added that there will be an "auction component" to that service.

The Web services are being developed by a number of companies, with IBM as the lead contractor. The site will be available in late summer to food wholesalers, retailers and distributors across North America.

■ **Volkswagen AG** earlier this month said it's joining IBM, i2Technologies Inc. in Dallas and Ariba Inc. in Mountain View, Calif., to create a global business-to-business digital marketplace to order parts, tools and office equipment online. Wolfsburg, Germany-based Volkswagen said it wouldn't take part in the Internet automotive trade exchange being set up by Ford Motor Co., General Motors Corp. and DaimlerChrysler AG.

Laurie Orlov, an analyst at Forrester Research Inc. in Cambridge, Mass., said she thinks Volkswagen's decision not to participate in the Big Three auto exchange is related to the fact that the U.S. Federal Trade Commission has started to investigate automakers – and their collaboration on online marketplaces – for antitrust collusion.

■ Members of **Star Alliance**, an international airline network, unveiled plans to lead the launch later this year of a buyer-driven, business-to-business e-commerce exchange for the global airline industry.

The exchange aims to allow participating airlines to buy supplies over the Web. The site will be managed and operated independently of any individual airline, said Ingvar Soderlund, director of corporate purchasing at Stockholm-based Star Alliance member Scandinavian Airlines System.

YOU HAVE MAIL
And these days it can clog your network with spam and huge attachments. Or disable you with viruses. E-mail exposes your network to a variety of performance problems that can send user productivity down the drain.
Content Technologies enables you to automatically block undesirable e-mail attachments from entering or leaving the network. You'll also protect your company from legal liability by preventing the circulation of offensive e-content.
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MAXIMUM SECURITY FOR THE E-WORLD

Open-Source Projects Get Done Cheaply

New Web sites give corporations and open-source developers way to meet

BY DOMINIQUE DECKMYN

IN DECEMBER, Anthony O'Krongly was looking for a workflow application that fit his company's needs. Instead of buying a boxed application or hiring a traditional consultancy to build one, he went out on a limb: He posted a request for proposals on SourceXchange.com, a virtual meeting place where corporations can connect with the wild world of open-source programmers.

SourceXchange.com is run by San Francisco-based Collab.Net Inc., which was co-founded by open-source pioneer Brian Behlendorf, one of the creators of the Apache Web server. Collab.Net is one of a handful of emerging online marketplaces that connect information technology people looking for resources with open-source developers. Others include Cosource.com (acquired by Westboro, Mass.-based Applix Inc. in December) and Scotts Valley, Calif.-based OpenAvenue Inc.

Saves Money

At marketing firm Galactic Marketing Inc. in Arlington, Texas, where O'Krongly is vice president of IT, the open-source approach to software development resulted in major savings. Hiring a firm to develop the workflow application would have cost $80,000 to $100,000, he says. Instead, he got the job done for $20,000 by developers he never even met. Five thousand dollars of that went to Collab.Net, which helped negotiate the deal and provided a reviewer to check code quality. The rest of the money went to a cadre of developers coordinated by Collab.Net.

The application, called WFTK, will start beta-testing next month and is expected to go into production in June. It will also be available for free from SourceXchange.com.

One of the reasons this type of development saves money, proponents say, is that the developers will build on existing open-source components rather than start from scratch or use commercial software.

"We know that developers in the open-source community are some of the most talented people out there," said Michael Wynholds, senior engineer at Sparks.com, a San Francisco-based online reseller of greeting cards. Via Collab.Net, the company got several proposals within weeks for building a new Web-server testing tool.

The work was handled by an open-source programming group at one-third of the price it would have cost to hire a consulting firm, said Wynholds. He said Sparks.com, which has been using the tool for a few weeks and is happy with it, sees the project as a test run and is considering using the same process for "serious business applications."

A few larger enterprises have dabbled in open source. Notable among them is San Jose-based Cisco Systems Inc., where chief print architect Damian Ivereigh created a piece of software that manages all print jobs for Cisco's worldwide operations. It was built out of pieces of open-source software such as Samba and Apache and is now available to everyone as Cisco Enterprise Printing System. A few companies are using it and have contributed minor fixes to the code, said Ivereigh.

Some analysts are skeptical about this model. "I don't think it's going to be a big trend," said David Folger, an analyst at Meta Group Inc. in Pleasanton, Calif. CIOs won't trust open-source developers to respect deadlines and deliver quality code, he said. As for handing the resulting applications back to open source, "I think people will want to keep their intellectual property rights for the bulk of their applications," he said.

But Tracy Corbo, an analyst at Framingham, Mass.-based Hurwitz Group Inc., said going the open-source route may make sense "when you need the work done but it's not the core of a business-critical system ... and you're resource-constrained."

"It really is a function of how core [the project] is to our core business," said O'Krongly, who acknowledged that he would be very hesitant to give away something that could give his company a competitive advantage.

"This [model] will have to prove itself," said Corbo. Companies like Collab.Net must be able to guarantee that open-source projects get delivered on time and meet specifications. "If they cannot do that, they won't succeed," Corbo added.

> [Hiring open-source developers] really is a function of how core [the project] is to our core business.
>
> ANTHONY O'KRONGLY, VICE PRESIDENT OF IT, GALACTIC MARKETING INC.

Some Firms on Slow Track To Initial Public Offerings

Dot-coms forcing firms into action

BY LEE COPELAND

Imagine a technology firm with a stable product, customers and profits that chooses not to go public. It happens.

Take data warehouse vendor SAS Institute Inc., for example. Raising cash was never an issue for the Cary, N.C.-based company, which has hundreds of millions in cash reserves.

"One main reason companies go public is they need the money," said SAS co-founder and CEO James Goodnight. "And we just plain don't need the money."

But after years of reticence, SAS plans to place 15% of the company's stock in an initial public offering (IPO) within 12 to 18 months, Goodnight said.

The IPO is aimed, in part, at helping SAS retain and reward employees and at making recruiting new talent easier, said Goodnight, who holds a majority stake in the firm along with co-founder John Sall.

Although Goodnight boasts that the company's employee turnover rate is a mere 5%, he acknowledges that his firm gets "cherry-picked by the dot-coms" that offer stock options to new recruits.

IPO-Bound

SAS Institute Inc., Cary, N.C.
$1B
Annual revenue

InfoImage Inc., Phoenix
$30M
Annual revenue

SAS is the world's largest privately held software company, with annual revenue of more than $1 billion and 23 consecutive years of double-digit revenue growth on an annual basis. The company's revenue grew 17% from 1998 to 1999, Goodnight said.

Analyst Mike Schiff at Current Analysis Inc. in Sterling, Va., said companies such as SAS face the problem of losing employees from companies they have acquired.

"You need equity for acquisitions," he said. "SAS is not hurting for dollars, but if you're going to keep the staff from a company that you acquired, you have to give them options to stay.

"Going public also puts you in the spotlight," he added. "It's great exposure."

Many companies, however, would rather avoid the spotlight of trading on the stock market. Founded in 1992, InfoImage Inc. in Phoenix, with estimated revenue of $30 million, delayed going public for years. After long success as a service provider, though, the company now feels that it has a strong position in the portal market and wants to capitalize on it, so it will announce this week that it plans to pursue an IPO.

InfoImage CEO Randy Eckel said he delayed going public to focus on developing a corporate Web portal software product, Freedom, instead of putting undue focus on meeting earnings expectations.

"I'm one of those people that thinks a company should go public only when it's ready," said Eckel. "I was nervous about being a public company in an early-adopter market. As a company, you need to be nimble, and that's harder as a public company."

Even as a private firm, however, InfoImage began offering options to employees in 1996. It has also increased its development staff from 12 to 70 in the past 24 months.

The negative side of going public, said Schiff, is managing quarterly expectations.

"Meeting expectations can be a headache," he said. "The last thing you want is an irate stockholder with 100 shares bothering you about executive decisions."

Can IT Managers Be Heroes?

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Few Takers for Benchmarks From Supply Chain Council

Guidelines are being used only by a select few major companies

BY CRAIG STEDMAN

THE JURY is still out on whether the benchmarking and modeling guidelines developed by the Supply Chain Council will gain widespread acceptance.

The guidelines, created in 1996 and updated this winter, are being used by major companies such as General Motors Corp., BP Amoco PLC, Dow Corning Corp. and Daimler-Chrysler AG's auto-parts division. But they seem to be in the minority, said council officials during the group's conference in Rosemont, Ill., earlier this month.

The number of companies that have fully implemented the guidelines and have had positive business results remains relatively small, they said. Things are "still in the embryonic stage in that sense," said Bill Hakanson, executive director of the Pittsburgh-based council.

"A lot of companies are just studying [the guidelines] and will decide later whether they want to implement them," he added. "These are massive companies that are looking at this, and massive companies don't make decisions very quickly."

Uncertain Number of Users

The council has more than 650 corporate members, and 150 companies have sent employees to workshops on how to implement the supply-chain guidelines. But Hakanson said it's difficult to quantify how many of those companies are actually using them.

The guidelines, which are known as the Supply Chain Operations Reference (SCOR) model, provide a set of benchmarks and business-process descriptions that firms can use to evaluate their supply-chain operations and then model new ways of doing business.

The guidelines are technology-neutral, but most of the users who spoke at the conference about their experiences with SCOR said they're making big investments in new back-office applications and supply-chain planning software as part of their projects.

Timothy Troup, a supply-chain specialist at Dow Corning in Midland, Mich., said the benchmarks that are built into the SCOR guidelines helped him show his company's executives a tangible picture of supply-chain shortcomings in areas such as delivering products to customers on time.

"We're a company of engineers, and we like numbers," Troup said. "When you can put those numbers up and show [business managers] that we're down here [on a chart] and the industry average is up there, they can relate to that pretty quickly."

In the Right Direction

At London-based BP Amoco's petrochemical division, the SCOR guidelines helped "point us in the direction we should be going" in order to improve supply-chain performance, said Ken Evans, who led a supply-chain assessment team at the unit and is now managing an installation of SAP AG's enterprise resource planning software.

But the guidelines still have some weaknesses, said Evans. For example, he said, a collection of suggested business processes appears to have been written mainly by vendors. "There's a lot more depth that could be put into [that section]," Evans said.

Many of the conference attendees were just trying to comprehend the SCOR guidelines. "I'm trying to understand what [SCOR is] all about," said Robert Miller, logistics information systems manager at Growmark Inc., an agricultural cooperative in Bloomington, Ill. "Hopefully, it can help us determine where we come up short and [how we] could improve things. But first, we have to learn how to use it."

How SCOR Was Defined

The Supply Chain Council, a nonprofit trade organization, was formed by representatives of Advanced Manufacturing Research, Bayer AG, Compaq Computer Corp., Pittiglio Rabin Todd & McGrath, Procter & Gamble Co., Lockheed Martin Corp., Nortel Networks Corp., Rockwell International Corp. and Texas Instruments Inc.

The first draft of the SCOR model was created in 1996 by a consulting firm that turned ownership of SCOR over to the Supply Chain Council in 1997. At this month's conference, the council announced a revised set of guidelines, which will be followed by a deeper revision this summer. Information on the Supply Chain Council and SCOR can be found at *www.supply-chain.org.*

– Craig Stedman

Handhelds Can Help Catch Medical Errors

Early hospital trials show promise

BY MATT HAMBLEN

Pharmacists and others pushing to reduce the number of medical errors are putting more drive into the sometimes moribund trend in the medical industry toward handheld-based systems to link information on drugs, patients and specimens.

At least 44,000 Americans die each year as a result of medical errors, making such errors the eighth leading cause of death, according to estimates in a report issued last year by The Institute of Medicine in Washington, a federally funded division of the National Academy of Sciences. The total cost of injuries related to medical errors is more than $17 billion a year, the institute said.

"Error reduction is a top mission at this hospital and the prime reason we instituted our handheld projects — not that we had high errors in the first place," said Michael Mutter, pharmacy manager at The Valley Hospital in Ridgewood, N.J., a 412-bed facility.

The hospital is concerned about keeping costs low with any information system, but what drove the hospital's push to implement handhelds was the need to cut down on errors, Mutter said.

Hands-On

Valley Hospital has begun a beta test of a medication-delivery system that involves SPT 1700 handhelds from Symbol Technologies Inc. in Ridgefield, N.J. The handhelds are equipped with bar-code scanners. In another project, Valley Hospital in the past year has used handhelds to guide technicians through record checks when blood samples are taken [Technology, April 17].

MICHAEL MUTTER: Handhelds cut costs, errors

Becton, Dickinson and Co. in Franklin Lakes, N.J., is providing the software and systems support for the projects. Valley anticipates spending more than $200,000 and expects to recoup that investment within about two years through administrative efficiencies like eliminating the need to enter data from paper forms or redo a blood test done on the wrong patient, which could lead to expensive additional days of care, Mutter said. In the thousands of blood samples taken each month, four to six were typically taken from the wrong patient or involved a mislabeled sample. Using the Becton Dickinson system, those errors have been eliminated, Mutter said.

"Handheld verification systems promise lots of improvements, but the technology alone won't prevent errors," said Mike Cohen, president of the Institute for Safe Medical Practices in Huntington Valley, Pa. It will "take time to get these systems implemented and productive."

Cohen and other analysts said the information technology infrastructure at most hospitals has been deficient in preventing errors, especially drug overdoses.

American Medical Response (AMR) in Aurora, Colo., this month is implementing a handheld system for 250 paramedics.

Using a Palm Inc. handheld to quickly collect patient data on preset forms may reduce errors caused by illegible writing on paper forms, said Lon Adams, an AMR paramedic in San Mateo County, Calif.

Another advantage of the handhelds is that the information will flow into a database to help doctors and paramedics determine which emergency treatments are truly beneficial. "We're finding that many of the treatments we thought were of benefit were not and in some cases actually harmed patients or complicated their in-hospital treatment," Adams said.

AMR is spending $75,000 on the handheld system, part of a $500,000 project to Web-enable the San Mateo County ambulance service, which serves 17 towns, said Eric Gee, manager of AMR's handheld project.

The American National Red Cross in Washington is building a handheld system that blood donors will use to register and answer a 40-question survey. The goal is to reduce errors and get risk-factor data into screening systems faster, said Red Cross process engineer Christopher Patton.

WORKSTYLES

IT Dads Push for Paternity Leave

Paternity expert James Levine has been getting a lot of calls lately.

It seems corporate leaders have been paying close attention to the media frenzy over whether British Prime Minister Tony Blair should take paternity leave after the birth of his child. And many are turning to Levine, director of the Fatherhood Project at the Families and Work Institute in New York, for advice about their own time-off policies for new dads.

BRITISH PRIME Minister Tony Blair has sparked debates about paternity leave

"I think the Tony Blair thing has prompted a lot of attention," says Levine, co-author of *Working Fathers: New Strategies for Balancing Work and Family.*

But paid paternity leaves, while more common now than a decade ago, are still relatively rare, he says.

High-tech companies, though, are bucking the trend. Along with competitive salaries and stock options, many IT businesses are offering paid paternity leave.

"The war for talent is so extreme," he says.

The push seems to be coming from young professionals – many without children – who work for Internet start-ups, says human resources specialist Anne M. Pauker, president of Pauker Consulting Group in Princeton Junction, N.J.

Although IT professionals are working long hours now, they hope to reap the benefits by the time they have children.

"It's a stage-of-life issue," said Pauker. "Many want to know it will be available when they have kids."

Cultural Messages

Before passage of the Family and Medical Leave Act of 1993, which requires companies to offer up to 12 weeks of unpaid leave for new fathers, only progressive businesses offered paternity leave, says Pauker. Since then, more companies have added policies for fathers, but only a tiny fraction of working men actually take advantage of the benefits.

"There are still far fewer dads that take leave than moms," says Pauker. "I mean far, far fewer.

"Very often, men are very self-conscious for taking these leaves," she explains. "I don't think it's in their imagination."

Jeffrey Henning, MIS manager at Internet survey software provider Perseus Development Corp. in Braintree, Mass., was working on a major project when his son, Nicholas, was born four years ago. He couldn't take any time off, he said, "much my wife's chagrin."

But last Christmas, Henning was able to take two weeks' paternity leave after the birth of his child, Caitlin Noel.

At Ventura, Calif.-based outdoor clothing company Patagonia Inc., paternity leave has been a given since 1985. All employees – men or women – with two years' tenure have up to a year to take an eight-week paid child-care leave, said Anita Garaway-Furtaw, director of family services at Patagonia.

Lotus Development Corp., Merrill Lynch & Co. and Microsoft Corp. also have good paternity leave policies, said Levine.

Changing Attitudes

The costs of paternity leave can often pay off in the long run, says Pauker.

"I think most managers would probably like people available to them 24 hours a day, seven days a week," she says.

But family leave can help people feel productive and committed to their work.

Pauker says she thinks IT companies will continue offering paternity leave, even if the job market sours and they aren't competing for workers.

"Once you give, can you take away?" she asked. "You can try. But your truly good people are going to leave."

– *Melissa Solomon*

JIM CHAMPY

Re-engineering redux

CAPITAL MARKETS have spoken. The promise of profits in business-to-consumer e-commerce is hollow — at least for now. Money to build the Amazon.coms of the future will be harder to come by. Peapod, the nation's first online grocery-shopping service, needed a cash infusion from a supermarket chain. The market caps of most consumer e-commerce companies have dropped dramatically.

The problem was quite predictable. The Internet is the great commoditizer. Prices went down as e-commerce companies tried to buy consumer loyalty. But, as the old joke goes, if you're losing money on every transaction, you can't make it up on volume.

What e-commerce companies have missed is that you can only buy customer loyalty by dramatically improving your value proposition — beyond price.

When Michael Hammer and I introduced the idea of re-engineering in 1992, we were principally focused on dramatically improving internal processes, like new product development, order fulfillment and service. For e-commerce to work, companies must look outside themselves and understand their customers' processes, like purchasing, bill payment and manufacturing, and offer ways to improve them in combination with their own. Why didn't "e-tailers" look at consumer processes and try to integrate them with their own? Real re-engineering is hard to do, and many New Economy venturers lived with the hope and promise that just having a slick Web site would do.

Companies must look outside themselves.

Now the question is whether business-to-business e-commerce will be any more successful. Capital markets have shifted their interests to business markets, but somewhat nervously. Investors should be concerned because so-called business-to-business digital marketplaces will succeed only if they offer re-engineered processes to sellers *and* buyers. Otherwise, these marketplaces will just drive down sellers' prices and offer no other value.

But that need not be the case. A General Motors executive recently told me that the digital marketplace the company is building to acquire automotive components is expected to improve many of GM's processes. GM estimates that production and inventory costs could both drop by as much as 15%, and the cost of a vehicle could be reduced by as much as 14%. Transaction costs on the $87 billion GM spends annually on purchasing components could also drop as much as 20%.

So how should companies that want to launch or join digital marketplaces think? Here's some advice for making the next round of re-engineering work better than the last one.

- Start thinking about standardizing processes in your industry — especially those that touch the customer. Processes like bill payment and presentment are good examples. Both sellers' and buyers' costs could be dramatically reduced if these processes were simplified and standardized. Business-to-business digital marketplaces finally provide this opportunity.
- Be prepared to operate with more standardized processes that may be offered by a third party. For example, there's a company operating today — eCredit.com Inc. — that will instantaneously evaluate and rate customer credit risks. Standardized processes done in-house will increasingly be outsourced to third parties. The Internet is the great enabler here.
- Consider offering your customers computing services through your digital marketplace. Small to medium-size companies that may buy your products don't manage computing well. Most would be very receptive to what I have described as a version of "ERP lite."
- Don't create a digital marketplace alone. No matter how big your company may be, you won't have all the products and services customers need. You can improve your customers' efficiency by giving them *the* place to shop. Offering variety is one of the great value propositions. That means that you and other sellers in your marketplace will have to align your processes to make it easy for your customers to shop.

It all adds up to one argument that I've been waiting 10 years to make: The New Economy won't work without re-engineering.

Champy is chairman of consulting at Perot Systems Corp. in Cambridge, Mass. He can be reached at JimChampy@ps.net. His newspaper columns are syndicated by Tribune Media Services.

Walking Disaste

Handhelds are everywhere, but they carry a lot of sensitive data and are easy to lose. So how do you keep these devices and their data from getting into the wrong hands? IT managers offer advice, from policies to passwords. By Matt Hamblen

AS AN IT MANAGER, Charles Novak never thought he'd be worrying about something called "promiscuous synchronizing." And despite warnings from some security experts, he's putting off the day he considers whether to recommend full-body searches for workers who could be hiding sensitive data on handheld computers or smart phones.

But Westinghouse Savannah River Co. in Aiken, S.C., makes weapons-grade plutonium and stores hazardous waste for the federal government, so the need to protect critical data from walking out the door is paramount, he says. Conceivably, a terrorist group could use the information to locate and steal secrets or deadly materials.

The coming flood of handheld computers and smart phones has made Novak, a technology planner at Westinghouse, rethink his assumptions about security. In 2003, there will be 1 billion smart devices connected wirelessly, and 600 million of those will be Web-enabled, say analysts at Gartner Group Inc. in Stamford, Conn.

"Setting a policy for use of handheld computers is the hardest part," Novak says. "Handhelds and smart phones are different creatures from laptops and other computers."

Many Risks

"It's terrifying when you think seriously about the security risks posed by handhelds," because there will be so many of them, says an information

BILL O'LEARY/THE WASHINGTON POST

A NEW HANDHELD devices wait to be claimed from the lost-and-found room at Baltimore-Washington International Airport

GADGETS AT THE LOST-AND-FOUND

Lost cell phones, PDAs and computers turned in at Reagan National and Dulles International airports in the Washington area.

1995	438
1999	1,066
2000 (1st quarter)	267

SOURCE: METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

OOPS!

AS EXECUTIVES AND salespeople roam the country with PDAs, there's a danger that sensitive company data could be lost in a taxicab or airport terminal.

Already, the lost-and-found departments at the nation's airports report a growing collection of digital devices – mostly cell phones, but also a handful of PDAs such as Palm Inc. organizers.

The collection at San Francisco International Airport would fill a cardboard box, says San Francisco Police Sgt. John Franicevich, who oversees the lost-and-found there. "We get a couple of notebooks a month, eight to 10 cell phones a week, a couple of PalmPilots," he says of the inventory.

His advice: Use the device's password protection and fill out the "owner page" so there's a chance the device can be reunited with you. Of course, most lost devices are kept by the finder and aren't turned in, Franicevich notes.

The Internet Lost and Found (*www.lostandfound.com*) run by Copreco Financial Inc. lists 88 electronic devices – 12 of them PDAs – currently reported lost. Meanwhile, Denver International Airport gets one or two calls per week from business travelers who have lost Palms and other electronic organizers, a lost-and-found clerk says.

Airport officials say the gadgets usually are left at security checkpoints or on those little shelves at public phones. One official says the best advice is simply to get to the airport early; most devices are lost when the owner is in a rush. – *Mitch Betts*

rs

technology planner at a soap manufacturing and distribution company in the Midwest, who asked to remain anonymous.

"Anything network-connected is a security risk, and just about any PDA [personal digital assistant], cell phone or pager is on a network sooner or later," says David Gerstenlauer, director of network development at Ikon Office Solutions Inc. in Norcross, Ga.

Analysts and some IT managers worry that a disgruntled worker or corporate spy could quickly download data to a device with memory as big as 128MB, and the act might go unnoticed partly because synchronizing between handhelds can become so commonplace that experts call it "promiscuous." Plus, some devices are so small they're easy to hide and can even send data packets wirelessly or via an infrared port.

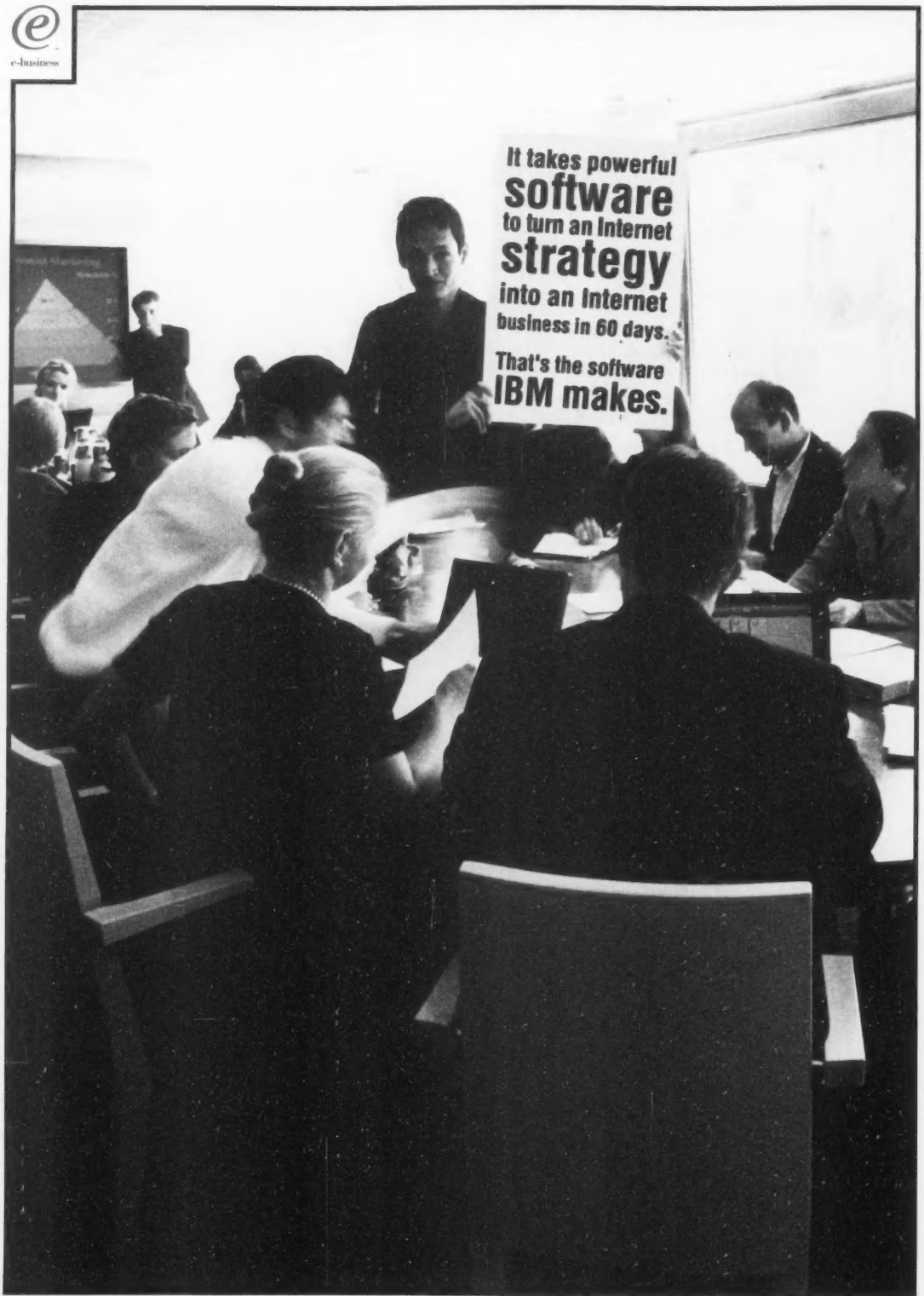
The greatest risk might come from losing a device. For example, an innocent user carrying important information might accidentally leave a phone or handheld device in an airport without having set up sufficient password protection to block malicious use, analysts say (see story above).

Managers at a large pharmaceutical company once called Gartner analysts for advice because they wondered what to do about a salesman who had loaded on his handheld information on patients involved in an oncology study. In another case, a client lost a handheld with his online trading password easily accessible; luckily, it was returned with no unauthorized trades.

Analysts say Novak is like many IT managers who are struggling to find out all the security vulnerabilities of handhelds and then to determine whether the risk of losing data is serious enough to warrant expensive protections. The risks he's confronting are greater than those at many companies. "Handheld security concerns are not on the Top 10 list of IT worries right now, but they will be next year," when more devices will be brought to work, says John Pescatore, a Gartner analyst.

The security problems associated with handhelds require legal, administrative and technical precautions, analysts say. Simple steps matter. For example, the company, not individual workers, should pay for the devices.

Continued on page 52



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IBM

Walking Disasters

Continued from page 49

Moreover, the employer should install common synchronization software on a server and set higher standards for use of passwords and for encryption when the devices are used on a wireless or other type of network.

Westinghouse has 15,000 employees. Some of its labs have outright bans on using handhelds, but others don't. So Novak is helping set policies that apply to labs that allow handhelds. "People bring them in all the time, but we are trying to contain them," he says.

Westinghouse is developing a usage agreement for handhelds. Similar to the one that covers the use of laptops, the agreement would basically require a worker to surrender the data on a handheld, even if the device is his personal property. The company's laptop policy states that a security officer suspecting a breach might return the laptop minus a hard drive. But Novak says he has yet to find a way to scour clean the read-only memory (ROM) in a handheld device so he can return it to a user.

Another problem Novak has found is that it's hard to identify some handhelds. Novak bought a dozen of Handspring Inc.'s new Visor handhelds but found they have no ROM identification number, which means there would be no way for a security guard to check whether a worker was walking out with the same device he had when he entered the building.

Novak's problems could be solved fairly simply if the company could require that company data be kept only on machines that the company purchased, analysts say. Yet, so far, less than 3% of the more than 3 million handhelds deployed in the U.S. and used by employees are purchased by companies, estimates Gartner analyst Ken Dulaney.

Experts say companies can begin to control the cost of supporting handhelds — and also security risks — by purchasing the devices and narrowing the choices from dozens of products to several. Next, corporations need to push their users to use the approved synchronization software that IT puts on a corporate server instead of the software that comes with each machine. That way, an IT shop can find synchronization software that works with several operating systems, and IT managers can monitor who is downloading corporate data.

"We have standardized on the cell phones people can use, but not the pagers or PDAs, and we have to come up with some policies for PDA usage and synchronization," says Ikon's Gerstenlauer.

Secure Transactions

Some companies that have raced to enter the consumer market for selling products and services via handhelds and the Web say security must be their top concern, or customers will stay away.

"We won't launch any application if it's not secure," says Joseph Ferra, a senior vice president at Fidelity Investments in Boston, which launched InstantBroker in 1998 to bring stock trades to customers via pagers and wireless handhelds.

Fidelity is working on digital certificate security to allow online wireless check-writing. The company has set a 128-bit encryption standard for all transactions.

Gartner analysts say some early experiences with wireless transactions weren't as secure as they should have been. Pescatore says he and another Gartner analyst, Bob Egan, ordered a book from Amazon.com Inc. via a Sprint PCS Group wireless phone last December and noticed that the phone allowed a user to insert a previously registered Amazon user name and password, but didn't hide the password with X's, as would be done on a PC. "That violates Security 101," says Pescatore [Technology, April 3].

Sprint PCS officials say the company decided it must keep the password visible as it's typed on a small, 10-button phone keypad. That practice will continue as a "technology trade-off," says Billy Stephens, director of product management and development for wireless data services at Sprint PCS. He urges phone users to keep their online phone e-commerce transactions as hidden from view as possible.

Also, the December transaction allowed Amazon to automatically bill a Pescatore purchase to one of his old credit cards without his authorization. Amazon.com says this wouldn't have been possible unless Pescatore had turned on the authorization via his PC.

And the transaction resulted in the Amazon password being cached on the phone's memory, something that Sprint officials say could be changed.

Joseph Baron, communications architect at Prudential Property and Casualty Insurance Co. in Holmdel, N.J., says agents are already using heavy-duty laptops and cellular phones in the field to respond to emergencies and have been trained to understand the security and privacy needs of customer data.

More handheld computers are expected, says Baron. "We would not want agents downloading sensitive data about a customer's policy from a corporate server to a handheld that some third party could see," he says.

But Alan Reiter, an analyst at Wireless Internet & Mobile Computing in Chevy Chase, Md., says companies setting up mobile workforces and consumer applications with handhelds aren't being careful enough. "Vendors and carriers need to be more worried about security and a lot, lot more worried about privacy," he says. "If they don't get on the ball, they are going to be surprised."

Analysts aren't as worried about data being sniffed or stolen from wireless transmissions in a company's wide-area network as they are about constantly connected devices such as PCs attached to a LAN. "Wireless sniffing is not a Top 10 worry," says Peter Tippett, vice chairman of ICSA.com in Reston, Va., a security consulting firm.

Egan says the threat of eavesdropping is greater over wireless LANs than WANs, where a hacker could find a wireless LAN router and try to hack into it from near a company's headquarters. But vendors are developing ways to protect wireless LAN routers from hacking.

Tippett says he believes a very cheap way to reduce security risks with handhelds is to require that passwords be six to eight characters long, using upper- and lowercase letters and punctuation marks. The passwords should also be assigned by a manager and changed monthly, he says.

The information security headaches from handheld devices may turn out to be even greater than the headaches caused by laptop PCs, because handhelds are smaller and thus easier to lose or steal.

"Everything that was a laptop security issue will be a serious issue for PDAs," says Robert P. Campbell, a security expert and managing director of Peak Consulting in Woodbridge, Va. "This is going to be a very serious problem, especially because senior executives will be using them for sensitive corporate information." ◗

TIPS FOR HANDHELD SECURITY

SECURITY ANALYSTS and IT managers advise you to do the following to keep information on your handhelds from getting into the wrong hands:

1. Have your company purchase handhelds and smart phones to make it clear who owns the critical data on them.
2. Set up synchronization software on a server common to all handhelds to ease administration and to assist in monitoring who is downloading what data.
3. Develop policies that explicitly state who owns the data, what data can be downloaded to a handheld and what data must be surrendered if questions arise.
4. Describe password protections and privacy concerns and risks to users. Passwords need to be changed often and assigned by an administrator so users won't pick obvious passwords.

– *Matt Hamblen*

PENN STATE

> Anything network-connected is a security risk, and just about any PDA, cell phone or pager is on a network sooner or later.
>
> **DAVID GERSTENLAUER, DIRECTOR OF NETWORK DEVELOPMENT, IKON**

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COMPUTERWORLD'S Annual Job Satisfaction Survey

IT'S THE OPPORTUNITIES, STUPID!

Think IT pros are greedy? Perhaps a bit. But the real key to keeping them from leaving doesn't involve money.

By Kathleen Melymuka

IN IT, YOU'RE EITHER going forward or backward — there's no in-between. Information technology folks who are moving forward — learning new skills, taking on stretch assignments and building their careers — are satisfied in their jobs. Those who are unable to get the training they want or who lack opportunities to take on challenging new assignments say they're unhappy because they feel they aren't working to their full potential.

That's the main message of this year's Annual Job Satisfaction Survey, and it comes with a troubling coda: More than half of the 575 respondents said their overall job satisfaction has decreased over the past year. So it seems that management isn't getting the message.

A systems analyst at an outsourcing company says he feels stuck in a support role that offers no challenges and no future. "It's a big headache to work with it, and I'm burned out," he says.

He'd like to move on to development, but he lacks the necessary skills and his company won't help him get training. "I'll have to do it on my own," he says — and you can picture him heading for the door.

A customer support manager at a new-media company says she's overlooked and underappreciated. "Once you're with a company for a while, you tend to get pigeonholed in your current responsibilities, and they forget that you may have other talents or abilities," she says. "That's where I am now. I feel underutilized."

These folks aren't alone. More than two-thirds of the IT workers surveyed said they aren't working to their full potential, and more than a quarter expect to leave their jobs within the next year.

But here's how it feels on the flip side: Howard Clodfelter, a senior applications analyst at Denver-based software firm J. D. Edwards & Co., says his company gives him both ample training and the opportunity to use that training on new projects. "I have all the things I need to do a good job, and that feels good," he says.

Technical people aren't afraid to work hard — very hard — if the project is stimulating and the technology is challenging.

The technology leader on a high-speed, high-pressure e-commerce project at a manufacturing company says the opportunity to work with cutting-edge technology in a project that's making an important contribution to the business more than compensates for the pressures of tight deadlines and killer hours.

"Even though it's more hectic than what they're used to, everybody I've met over here is so thrilled to be here, they wouldn't go anywhere else," he explains.

It doesn't always take bleeding-edge technology to keep people happy. A clear sense of career progression may do the trick. For example, a program manager at a government contractor was getting near the end of her rope when a new opportunity turned her around.

"I've been promoted into a new position, and I have more responsibility and feel more challenged," she reports. "I like what I'm doing, and I'm not bored or feeling underutilized."

These are people who feel they're working to their full potential, but unfortunately, only one in four of our survey respondents said they feel that way.

A Happy Band

Despite frequent dissatisfaction with individual situations, the survey group is overwhelmingly happy with the field and the people with whom they share it. Nearly nine out of 10 said they're satisfied with technology as a field of work.

More than two-thirds are happy with their relationships with both clients

and peers at work, and many said their colleagues are a main source of satisfaction on the job.

"The people are my favorite part," says a systems manager at a large insurance company. "There's a lot of teamwork, a lot of brainstorming, a lot of support."

The ability of IT team members to work well together clearly affects both retention and productivity. For example, the director of network services at a state government agency says his supervisor has invested heavily in team building. The result has been not only a top-performing team, but one that values each member and perseveres despite below-par salaries.

"We get a lot of recognition for the work we do," he says. "Everyone's treated with respect, and everyone's ideas are wanted. None of us is here for the salary. We're here for the satisfaction of knowing we do a good job."

Managers fared worse than co-workers in employees' eyes. Approximately half of the respondents are satisfied with their managers, while approximately one-third said their bosses need improvement.

Erika Muller, a network engineer at LAN Associates in Babylon, N.Y., has experienced both good and bad situations. She recently left a company where she says she felt management left her "floating in the ether" all the time.

"I was floundering around, and when I asked for guidance, I never got any," she says.

At her current workplace, she explains, "we have real management instead of people who say they're managers but don't manage anything. Managers here stay in touch. They expect accountability."

For example, she says, "my manager will ask what I did at the client site, how it went [and] whether I need any other tools or help. Basically, there is somebody here who cares."

The Business Connection

Clearly, IT people care about the business and identify strongly with business issues. Approximately two-thirds said they understand the business mission and the issues in their industry. While it's important to them to be involved in the business, they are about evenly divided between those who perceive that they can influence the company's success on a day-to-day basis and those who feel they can't.

A systems analyst at a manufacturing company says he's very pleased with his current assignment, which involves rotating through various business units. "I get to see different facets of the company, not just from a systems perspective but from a process perspective," he says.

On the other hand, employees who don't feel that they have a strong connection with the business are less satisfied.

"We aren't actually part of the business," laments an IT coordinator at an agricultural products maker. "We're not what makes money, so if cuts come, new initiatives are put to the side."

Time and Money

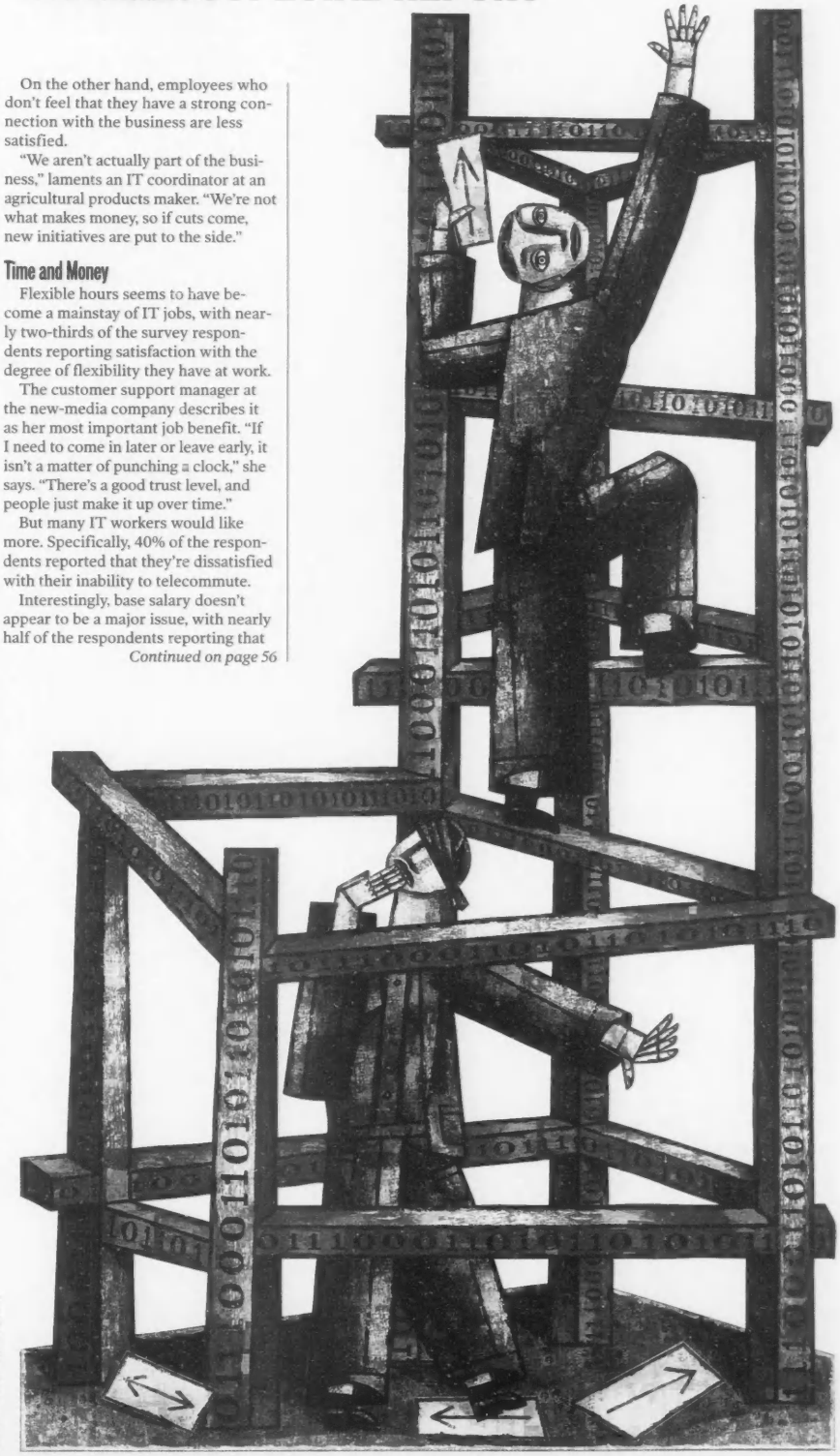
Flexible hours seems to have become a mainstay of IT jobs, with nearly two-thirds of the survey respondents reporting satisfaction with the degree of flexibility they have at work.

The customer support manager at the new-media company describes it as her most important job benefit. "If I need to come in later or leave early, it isn't a matter of punching a clock," she says. "There's a good trust level, and people just make it up over time."

But many IT workers would like more. Specifically, 40% of the respondents reported that they're dissatisfied with their inability to telecommute.

Interestingly, base salary doesn't appear to be a major issue, with nearly half of the respondents reporting that

Continued on page 56



ILLUSTRATIONS BY RICHARD DOWNS

COMPUTERWORLD'S Annual Job Satisfaction Survey

Continued from page 55

they're satisfied with their salaries and only about 12% saying they're very dissatisfied.

But there are issues that involve money and performance that clearly need attention. Slightly more than half of the respondents reported dissatisfaction with the amount and frequency of bonuses, as well as the relationship of pay to performance.

"I'm pleased with my pay," the customer support manager says, adding that she's actually thinking about negotiating to trade an upcoming raise for more time off to spend with her family.

But she has some problems with the way money gets distributed at her workplace. "I think others here with less experience are making more, so I'm somewhat dissatisfied about that," she says.

Mounting Stress

Given the level of dissatisfaction with various issues, it isn't surprising that stress is pervasive in the IT workplace. Three out of four respondents reported that their jobs are stressful or very stressful, and more than half said their stress levels are going up.

On-the-job stress seems to relate at least as much to people's sense of hitting career walls as it does to the infamous IT workload, however. While approximately 20% cited workload as the chief factor contributing to stress, about 30% cited lack of career development or inability to use current technology.

The IT coordinator says he's stressed by his company's failure to use newer technology. "We sit back and wait for everybody else to try it first," he says. "It's frustrating."

He says he'd be more likely to change jobs for better technical and career opportunities than for more money, and that puts him in the mainstream of respondents. Though salary was the standard answer respondents gave for leaving their last jobs, nearly three times as many complained about either lack of training, advancement or challenges.

The message from this year's job satisfaction survey couldn't be clearer: Help them grow or watch them go. ▮

IT LEAVES ROOM FOR IMPROVEMENT

■ **Despite all the hype about salaries and stock options, life in information technology apparently still isn't all it's cracked up to be. Respondents to our survey said their overall job dissatisfaction continues to grow, with opportunities for advancement, opportunities to discuss their career goals with managers and access to training earning the lowest grades in our annual report card on job satisfaction. The letter grades below represent approximately how our respondents graded their employers on key job issues.**

	1996 Grade	1997 Grade	1998 Grade	1999 Grade	2000 Grade
Salary	C	B-	C-	B-	C+
Opportunities for advancement	D-	D	D	D	D
Use of new technology	C+	B	B	B	B
Challenging assignments	B	D+	B	B+	B
Career goals/planning	NA*	NA	C	C	D+
Access to training	C	C	C	C+	D+
Manageable job stress	A-	B+	B+	B-	B
Overall job satisfaction	B-	B	B-	B	C-

*NA = NOT APPLICABLE

Some Work Cultures Are Better Fits

■ **Where you work obviously has the greatest impact on job satisfaction, and that includes the segment of the IT workforce you're in. IT contractors expressed the lowest levels of job satisfaction in most major categories, while consultants generally reported the highest satisfaction levels. But bonuses continue to be a sore point for all IT workers, whether they work at user companies (non-high-tech), technology vendors, consultancies or contracting firms.**

	User	Vendor	Consultant	Contractor
Satisfaction with salary				
Very satisfied	11%	13%	24%	0%
Somewhat satisfied	35%	34%	33%	53%
Neither satisfied or dissatisfied, or NA*	16%	10%	16%	13%
Somewhat dissatisfied	24%	29%	18%	27%
Very dissatisfied	14%	14%	9%	7%
Frequency and amount of bonuses				
Very satisfied	8%	8%	9%	0%
Somewhat satisfied	17%	20%	11%	0%
Neither satisfied or dissatisfied, or NA	19%	16%	20%	13%
Somewhat dissatisfied	19%	24%	29%	27%
Very dissatisfied	37%	32%	31%	60%
Connection between pay and performance				
Very satisfied	8%	5%	9%	0%
Somewhat satisfied	17%	17%	20%	20%
Neither satisfied or dissatisfied, or NA	18%	24%	20%	20%
Somewhat dissatisfied	25%	28%	33%	33%
Very dissatisfied	32%	26%	18%	27%
Opportunities to discuss career goals				
Very satisfied	18%	12%	22%	33%
Somewhat satisfied	21%	25%	22%	7%
Neither satisfied or dissatisfied, or NA	18%	20%	16%	7%
Somewhat dissatisfied	24%	27%	24%	40%
Very dissatisfied	19%	16%	16%	13%
Opportunity for advancement				
Very satisfied	8%	8%	16%	0%
Somewhat satisfied	18%	15%	27%	33%
Neither satisfied or dissatisfied, or NA	20%	25%	17%	27%
Somewhat dissatisfied	27%	28%	13%	20%
Very dissatisfied	27%	24%	27%	20%
Opportunity to use new technologies				
Very satisfied	22%	19%	33%	13%
Somewhat satisfied	32%	39%	24%	53%
Neither satisfied or dissatisfied, or NA	14%	13%	8%	7%
Somewhat dissatisfied	20%	15%	22%	7%
Very dissatisfied	12%	14%	13%	20%
Opportunities for interesting projects				
Very satisfied	20%	17%	22%	20%
Somewhat satisfied	32%	30%	31%	40%
Neither satisfied or dissatisfied, or NA	17%	21%	9%	6%
Somewhat dissatisfied	22%	22%	31%	27%
Very dissatisfied	9%	10%	7%	7%
Ability to influence decisions affecting you				
Very satisfied	16%	14%	20%	7%
Somewhat satisfied	32%	30%	24%	47%
Neither satisfied or dissatisfied, or NA	18%	20%	11%	12%
Somewhat dissatisfied	19%	25%	29%	27%
Very dissatisfied	15%	11%	16%	7%
Access to training and education				
Very satisfied	17%	10%	20%	13%
Somewhat satisfied	26%	30%	33%	20%
Neither satisfied or dissatisfied, or NA	16%	20%	9%	7%
Somewhat dissatisfied	16%	21%	20%	27%
Very dissatisfied	25%	19%	18%	33%
Workload				
Very satisfied	8%	7%	16%	0%
Somewhat satisfied	26%	30%	36%	47%
Neither satisfied or dissatisfied, or NA	24%	28%	21%	0%
Somewhat dissatisfied	25%	23%	16%	40%
Very dissatisfied	17%	12%	11%	13%
How has your overall satisfaction changed over the past year?				
Increased	25%	18%	38%	67%
Stayed the same	21%	24%	9%	20%
Decreased	54%	58%	53%	13%

*NA = NO ANSWER GIVEN

Grumpier Old Men (and Women)

■ Who says things get better with age? Certainly, not many of the respondents to our survey. In many key areas, levels of satisfaction either showed no improvement or declined as the average age of IT workers increased. The largest drops in satisfaction are in opportunities to discuss career goals, use new technologies and advance. Scoring better, but still needing improvement, are access to training and education and the ability of employees to influence decisions that affect them.

Age Range	18-24	25-34	35-44	45-54	55+
Satisfaction with salary					
Very satisfied	13%	11%	11%	15%	14%
Somewhat satisfied	27%	37%	37%	33%	35%
Neither satisfied or dissatisfied, or NA*	20%	12%	15%	10%	18%
Somewhat dissatisfied	27%	25%	24%	28%	19%
Very dissatisfied	13%	15%	13%	14%	14%
Frequency and amount of bonuses					
Very satisfied	13%	4%	9%	10%	11%
Somewhat satisfied	1%	20%	17%	11%	24%
Neither satisfied or dissatisfied, or NA	13%	14%	16%	22%	19%
Somewhat dissatisfied	40%	19%	22%	21%	19%
Very dissatisfied	33%	43%	36%	36%	27%
Connection between pay and performance					
Very satisfied	13%	8%	6%	7%	11%
Somewhat satisfied	13%	18%	19%	14%	19%
Neither satisfied or dissatisfied, or NA	14%	21%	15%	24%	21%
Somewhat dissatisfied	27%	23%	29%	26%	27%
Very dissatisfied	33%	30%	31%	29%	22%
Opportunities to discuss career goals					
Very satisfied	20%	20%	20%	10%	19%
Somewhat satisfied	33%	22%	20%	23%	16%
Neither satisfied or dissatisfied, or NA	20%	15%	14%	23%	19%
Somewhat dissatisfied	27%	25%	26%	27%	19%
Very dissatisfied	0%	18%	20%	17%	27%
Opportunity for advancement					
Very satisfied	27%	9%	7%	7%	8%
Somewhat satisfied	27%	18%	23%	14%	11%
Neither satisfied or dissatisfied, or NA	6%	23%	19%	21%	27%
Somewhat dissatisfied	20%	25%	24%	32%	22%
Very dissatisfied	20%	25%	27%	26%	32%
Opportunity to use new technologies					
Very satisfied	27%	21%	24%	20%	24%
Somewhat satisfied	40%	41%	32%	29%	24%
Neither satisfied or dissatisfied, or NA	0%	11%	13%	12%	22%
Somewhat dissatisfied	20%	14%	19%	23%	22%
Very dissatisfied	13%	13%	12%	16%	8%
Opportunities for interesting projects					
Very satisfied	39%	17%	21%	19%	27%
Somewhat satisfied	27%	33%	32%	31%	30%
Neither satisfied or dissatisfied, or NA	0%	16%	15%	20%	16%
Somewhat dissatisfied	27%	22%	25%	21%	19%
Very dissatisfied	7%	13%	7%	9%	8%
Ability to influence decisions affecting you					
Very satisfied	20%	17%	18%	11%	16%
Somewhat satisfied	33%	41%	29%	29%	24%
Neither satisfied or dissatisfied, or NA	14%	16%	19%	14%	20%
Somewhat dissatisfied	20%	15%	18%	34%	16%
Very dissatisfied	13%	11%	16%	12%	24%
Access to training and education					
Very satisfied	33%	13%	18%	11%	24%
Somewhat satisfied	20%	27%	28%	26%	32%
Neither satisfied or dissatisfied, or NA	14%	12%	13%	25%	16%
Somewhat dissatisfied	13%	20%	20%	14%	14%
Very dissatisfied	20%	28%	21%	24%	14%
Workload					
Very satisfied	7%	13%	8%	6%	8%
Somewhat satisfied	53%	27%	29%	25%	30%
Neither satisfied or dissatisfied, or NA	20%	23%	26%	20%	24%
Somewhat dissatisfied	20%	23%	24%	29%	22%
Very dissatisfied	0%	14%	13%	20%	16%
How has your overall satisfaction changed over the past year?					
Increased	40%	26%	27%	18%	46%
Stayed the same	27%	15%	18%	25%	35%
Decreased	33%	59%	55%	57%	19%

*NA = NO ANSWER GIVEN

Little Difference Between the Sexes

■ Has the glass ceiling for women in IT finally been smashed? Or are women simply now being denied the ability to advance in their careers just as much as their male counterparts are? The results of our survey seem to indicate the latter, as men and women gave very similar scores to the same satisfaction questions. Other areas needing the most improvement, according to both men and women, are frequency and amount of bonuses, workload and connection between pay and performance.

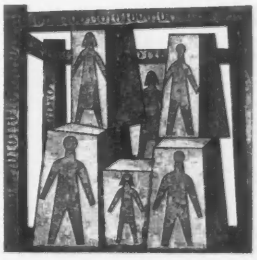
	Men	Women
Satisfaction with salary		
Very satisfied	13%	10%
Somewhat satisfied	34%	39%
Neither or NA*	14%	13%
Somewhat dissatisfied	25%	25%
Very dissatisfied	14%	13%

*NA = NO ANSWER GIVEN

	Men	Women
Frequency and amount of bonuses		
Very satisfied	8%	8%
Somewhat satisfied	16%	17%
Neither or NA	17%	20%
Somewhat dissatisfied	23%	14%
Very dissatisfied	36%	41%
Connection between pay and performance		
Very satisfied	6%	6%
Somewhat satisfied	17%	19%
Neither or NA	19%	20%
Somewhat dissatisfied	28%	20%
Very dissatisfied	28%	35%
Opportunities to discuss career goals		
Very satisfied	18%	16%
Somewhat satisfied	21%	25%
Neither, or NA	17%	13%
Somewhat dissatisfied	25%	29%
Very dissatisfied	19%	17%
Opportunity for advancement		
Very satisfied	8%	7%
Somewhat satisfied	18%	20%
Neither or NA	21%	21%
Somewhat dissatisfied	27%	25%
Very dissatisfied	26%	27%

	Men	Women
Opportunity to use new technologies		
Very satisfied	23%	17%
Somewhat satisfied	35%	28%
Neither or NA	12%	17%
Somewhat dissatisfied	17%	25%
Very dissatisfied	13%	13%
Opportunities for interesting projects		
Very satisfied	21%	14%
Somewhat satisfied	30%	37%
Neither or NA	18%	14%
Somewhat dissatisfied	22%	25%
Very dissatisfied	9%	10%
Ability to influence decisions affecting you		
Very satisfied	16%	14%
Somewhat satisfied	33%	29%
Neither or NA	18%	16%
Somewhat dissatisfied	20%	26%
Very dissatisfied	13%	15%
Access to training and education		
Very satisfied	15%	20%
Somewhat satisfied	27%	26%
Neither or NA	18%	11%
Somewhat dissatisfied	17%	20%
Very dissatisfied	23%	23%

	Men	Women
Workload		
Very satisfied	9%	7%
Somewhat satisfied	28%	28%
Neither or NA	25%	21%
Somewhat dissatisfied	24%	27%
Very dissatisfied	14%	17%
How has your overall satisfaction changed over the past year?		
Increased	23%	27%
Stayed the same	21%	16%
Decreased	56%	57%



***Computerworld*'s Annual Job Satisfaction Survey Methodology**

■ In February and March 2000, *Computerworld* invited visitors to its Web site to take the Annual Job Satisfaction Survey. The survey was administered online to 575 IT professionals with titles ranging from PC operator to CIO. Shown here are the responses of 427 men, 104 women and 44 respondents who didn't specify gender. Of the survey respondents, 357 were employed at user organizations, 111 were employed at IT vendor companies, 45 were IT consultants, 15 were IT contractors and 47 didn't specify a type of company.

Patents in E-Commerce

DEFINITION

A patent grants a property right to an inventor for 20 years, prohibiting others from using the invention in the U.S. As companies venture into the unchartered territory of e-commerce, several seek to patent their work. But the spread of e-commerce patents has raised questions about whether they are too broad and what, if any, limits should be imposed.

BY STEVE ALEXANDER

THE RISE OF e-commerce has produced a flood of Internet-related patents that make infringement as easy as a single click of the mouse.

Barnesandnoble.com Inc. learned that the hard way when Amazon.com Inc. slapped the company with a lawsuit claiming infringement on Amazon's patent for single-click technology, which lets repeat customers shop the site without having to re-enter personal and credit-card information.

The flood of Internet patents, say attorneys, is a natural evolution of the 1990s trend toward patenting not only hardware but also software and business methods.

As a result, many experts say information technology workers may be in for a rough ride as they are forced to learn about patents and patent infringement for the same reason that corporate management was forced to learn about IT: Because ignorance can touch off a business disaster.

Others say IT professionals can breath easy because the flood of patents will soon subside as the U.S. Patent and Trademark Office gains familiarity with Internet issues and applies stricter standards to future patents.

Such assurances have done little to ease concerns about the number of patents being issued today and the broad protections they provide.

Jonathan Band, an intellectual property attorney at Morrison & Foerster LLP in Washington, says there is widespread concern over whether patents like Amazon's are too broad.

"A lot of people think [Amazon] shouldn't have been able to patent that," Band says.

Kenneth K. Dort, an attorney and a senior litigation partner at Gordon & Glickson LLC in Chicago, agrees. Internet patents, he says, "have kind of gotten out of hand."

Part of the problem, explains Dort, is that attorneys, fearing the repercussions of failing to patent something important, advise clients to patent some things just to cover themselves.

"So you literally get simple processes or methods of business organization being patented," he said.

For instance, many people questioned the validity of Priceline.com Inc.'s patent on its method of letting customers propose their own prices for products or services on the Internet.

"I think the Amazon patent may be patentable because it is a rather discrete way of how to maintain the confidentiality of information," says Dort. "But the Priceline.com patent gets a little closer to the line. What it describes is way of conducting business. I think Priceline-type patents really do go too far afield by trying to keep people out of the industry in question."

But Jeffrey R. Kuester, an intellectual property attorney and partner at Thomas, Kayden, Horstemeyer & Risley LLP in Atlanta and chairman of the American Bar Association's special committee on patents and the Internet, says he disagrees.

Kuester says the Internet patent problem is exaggerated by people who don't understand what the patents protect.

"It's easy to overestimate the breadth of a patent application if you read only the title or the abstract. Nine out of 10 patents are not as broad as they sound," he says.

Norman Imamshah, director for computing and telecommunication services at Central Washington University in Ellenburg, Wash., doesn't see much of a threat in the number of Internet patents being approved.

His hope is that the government, by granting a large number of Internet patents, will promote e-commerce by rewarding innovation. That would benefit most IT workers, he says.

Still, the patent debate isn't over yet, says Imamshah.

"It's a very sticky issue, and it will be with us for a long time," he predicts. "But right now, it's really a lawyer issue."

Proceed With Caution

Kevin Rivette, chairman of intellectual property management firm Aurigin Systems Inc. in Cupertino, Calif., and co-author of *Rembrandts in the Attic*, a book about the value of patents, says some Internet patents are probably too broad. But he cautions IT industry leaders not to compound the problem by patenting everything connected with electronic business or the Internet.

Instead, he suggests that they adopt new ways of deciding what to patent.

"IT needs to ask marketing, 'What are the top five features that customers need in this new product?' " Rivette says. "Then they need to ask the same question of customer service, sales, production and research and development. Typically, they'll find there will be two to four top features that everybody agrees are critical to the success of the product. Those are the things you should patent."

Rivette predicts that the Internet patent flood will take five or six years to subside. In the meantime, he favors the creation of Web sites where patent claims could be easily read by the people who might help invalidate them by citing the existence of "prior art." Demonstrating previous use of something is a key way of invalidating a patent, he says.

Band also predicts that "the rush of Internet patents will slow down. People will continue to apply for them, but the patent office will not be issuing as many patents, or [it] will do it more carefully and properly."

As a result, Band says that "in the long run, most of the IT people in e-commerce are not going to be affected, although those being sued probably will be hurt."

Dort isn't as optimistic about a slowdown in the patent boom.

"I don't see there being any break until the courts or Congress steps in," he says.

Alexander is a freelance writer in Minneapolis. Contact him at sorion99@yahoo.com.

Controversial Internet Patents

AMAZON.COM's patented one-click system enables repeat online customers to place orders without re-entering credit-card or address information. Part of the patent covers the way Amazon stores billing and shipping data. In December, Amazon obtained a preliminary court injunction against Barnesandnoble.com that prevents the Amazon competitor from using the one-click system.

PRICELINE.COM patented a method by which a customer could propose a price for a product or service, and the order would be filled if a seller was willing to accept that price. Priceline.com sued Microsoft Corp. and its Expedia Inc. travel service for allegedly violating Priceline's method of letting consumers propose their own prices for flights and hotel rooms.

First On The Scene

Kevin Rivette, co-author of *Rembrandts in the Attic*, an intellectual property book published by Harvard Business School Publishing, says *Wired* magazine could probably have patented the now-ubiquitous Web page banner advertisement.

A patent on banner ads, which, when clicked on, transports the viewer to the advertiser's Web site, would now be quite valuable. Rivette suggests that *Wired* should have engaged in what he calls "choke-point analysis" to figure out what it should patent.

"What you want to patent are the things that will prevent your competitors from solving the same industrywide problem that you are solving," Rivette says. "If *Wired* didn't patent any other stuff, they should have patented the banner ad, because it was the one thing that everybody who was going to compete with them had to do. It was the industrywide problem that they solved – the choke-point."

– Steve Alexander

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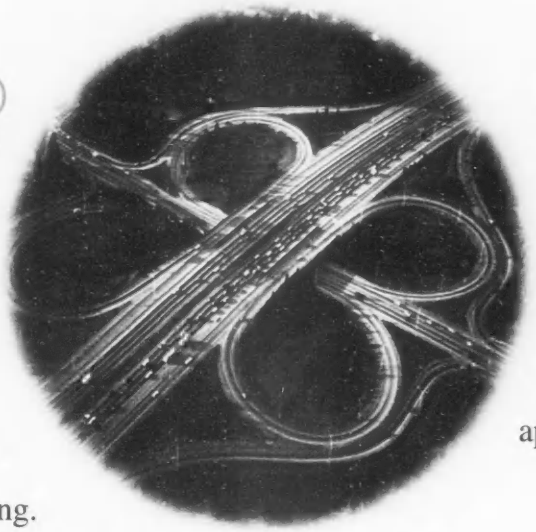

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Browser-based Terminal Emulation

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Dear Career Adviser:

I am a 58-year-old male who started as a computer operator, eventually rising to programming manager in 1976. That company was sold, and I obtained my certified network administrator/Certified NetWare Engineer certification, working my way back into programming.

Until last February, I was at a consulting firm doing Y2k remediation on Cobol and Assembler programs. Now I don't get interviews, and when I do, I'm told I don't have enough experience.

— CONFUSED

Dear Career Adviser:

I am a newly trained low-level Visual Basic programmer seeking an internship with a firm that uses Visual Basic. How do I start looking for a job?

— NEWBIE

Dear Confused and Newbie:

You have something in common! Whether overly experienced in an older job market or just coming in, you both have skill sets that typically don't generate jobs through Internet job boards or by applying via a company's Web site.

In fact, recruiters searching résumé databases will be unable to find your résumés or will screen you out. Additionally, at job fairs, you're at a disadvantage against competitors with skills that better match companies' requirements.

The solution: Increase both your personal contacts and your energy. Take courses, go into online discussion groups and attend every technical event, user group meeting and trade show you can. When you talk about your skill set, exude commitment!

Do you program at home, figuring out solutions to complex problems? Can you pull apart a particular application and show you really know it inside out? If so, this kind of passion — plus a person to help you — will transcend the rough sledding you're both experiencing now.

Dear Career Adviser:

I have a bachelor's degree in computer science with a background in C, C++ and Windows NT networking. I've been working with hardware but still focusing on software. Now I want to get into an e-commerce company and work on software applications. Do I have a chance?

— TRANSACTION-ORIENTED

Dear Oriented:

"Oriented will need to learn that, for e-commerce applications jobs, the challenging part is the speed [at] which you're doing the work and the fact that you're operating in [an around-the-clock] world where you can't be down even for a minute," says Joe Kwan, vice president of technology at CareGuide.com in San Francisco, a company specializing in elder- and child-care resources.

Kwan says the logic itself in a dot-com world is a lot easier and that there is some overlap between the dot-com and electronic design automation worlds, such as configuration management and version control. But you will need to at least "talk the talk" regarding software applications specific to dot-coms, plus demonstrate some sensitivity to issues such as transaction databases and publishing and e-commerce software if you want to get hired. The bottom line is that once a manager gives you a chance, with three to six months of hard work, you could re-emerge as a competent e-commerce technocrat, Kwan predicts.

Dear Career Adviser:

I have a bachelor's degree in computer science and work in information technology. I was thinking of getting a master's degree in information systems, but what I really want is to work in some leading-edge technology such as speech recognition. What do I need to do next, and where should I look?

— FREE SPEECH

FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at *www.computerworld.com/career_adviser.*

Dear Speech:

You'll most likely need to move back to your computer science origins to pursue this hot field. Companies like AT&T Corp., IBM, SpeechWorks International Inc., Nuance Communications, Tellme Networks Inc., BeVocal Inc. and TelSurf Networks Inc. are all seeking people who are well-versed in platforms and standard application programming interfaces, and for those who can work on programming applications using emerging standards such as VXML, Java, ECTF S.100, CTMedia, C and C++, says Jay G. Wilpon, director of advanced speech technologies at AT&T Bell Laboratories in Murray Hill, N.J.

For these firms, a prize hire has those skills, plus a background in either digital signal processing, linguistics and computer science or human-factor design. This is the "art" that's used to build complex applications, since any successful application of speech has a strong human-factor component.

If you're interested in inventing the best speech recognizer in the world, join the Signal Processing Society, which is part of the Institute of Electrical and Electronics Engineers Inc. (*www.ieee.org*), and expect lots of change. ◗

BRIEFS

Service Provider Marketplace Debuts

Business-to-business Internet service provider NewMediary.com Inc. last week launched an online marketplace (*www.newmediary.com*) dedicated to Internet-related services – from Web site design, hosting and e-commerce providers to Web-savvy law firms, public relations agencies and consultants. Access to Newtonville, Mass.-based NewMediary.com's site and request for proposal (RFP) service is free to users. Vendors also have free access to the Web site and can create a basic vendor profile. They can purchase vendor directory packages to respond to buyer-posted RFPs and add the information to their company profiles.

Schools Make Profit

The New York City Board of Education on April 12 voted to launch the first kindergarten-through-grade-12 revenue-generating Internet portal in the country. The revenue would be used to buy hardware, including laptops for every fourth-grade student and teacher, beginning next year. The plan would also provide e-mail addresses for the city's 1.1 million students and 150,000 teachers, administrators and support personnel, the board said.

Wireless Use Soars

Wireless subscribers increased by 24% last year, according to an annual survey released earlier this month by the Cellular Telecommunications Industry Association (CTIA) in Washington. The survey of 3,216 wireless systems in the U.S. – out of the 3,518 in operation – showed that there were 86 million subscribers last year, up from 69 million in 1998 and 55 million in 1997. Revenue reached $40 billion in 1999, up from $33 billion in 1998, according to the CTIA survey. The average local monthly bill for last year was $41.24.

Training Tax Credit

To help combat the state's shortage of information technology workers, Arizona Gov. Jane Dee Hull said earlier this month that she plans to sign a bill that would provide tax credits of up to $1,500 per year for IT training. If passed, the Technology Training Tax Credit Act would be the first such legislation in the U.S. The bill was spearheaded by industry associations, including the Arizona Software & Internet Association in Scottsdale and the Information Technology Association of Southern Arizona in Tucson.

E-Commerce Doubles

A study of online retail activity reports that electronic sales more than doubled last year, reaching $33.1 billion in North America. The study, conducted by online retailing trade association Shop.org in Silver Spring, Md., and The Boston Consulting Group, predicts the figure will climb to $61.1 billion by year's end. Travel, computer hardware and software, and financial brokerage services led e-commerce sales last year, accounting for $20.1 billion, according to the report, which was based on data from the survey of 221 online retailers.

Net Growth Predicted

Internet market makers are predicting explosive growth and migration to next-generation solutions, according to a study released last week by global management consulting firm A. T. Kearney Inc. in Chicago. The study, commissioned by e-commerce solutions provider Casbah Corp. in San Jose, also reported that market makers foresee a major shift in revenue sources from transaction fees to value-added services like logistics, escrow and payment services, inventory management and order fulfillment. The study was based on more than 85 interviews with Internet market makers serving 10 industries.

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CONFERENCE AGENDA

Sunday, June 18, 2000

12:00pm - 5:00pm
Registration

7:00pm - 9:30pm
Pre-Conference Networking Reception

Monday, June 19, 2000

8:30am - 9:00am

Welcome and Opening Overview
Maryfran Johnson, Editor-in-Chief
Computerworld

9:00am - 9:45am

Opening Keynote: "IT Leadership vs. E-Leadership"
Charlie Feld, E-Leader and former CIO, Delta Airlines
CEO, The Feld Group

10:00am - 11:30am

"The Naked Truth About B2B E-Commerce"
Kevin Fogarty, Business Editor
Computerworld

E-COMMERCE

Moderator

Panelists:
Robert Schwartz, VP & GM Panasonic Corp.
Kathy Brittain-White, CIO & EVP Cardinal Health (cardhealth.com)
Peter Burrows, CTO Reebok International
John Keast, CIO/CTO NetworkOil
Bruce Carver, VP of Informational Management and Technology Reynolds & Reynolds

Everybody's talking about business-to-business collaboration as the hottest of the online trends in 2000. But many feel this emperor still has no clothes. This panel will cut through the hype surrounding e-marketplaces, answering some critical questions on the benefits versus the risks. Should your company participate in someone else's B2B marketplace or create your own? When and how do you measure ROI when you're executing at Internet speed? There are multiple decision points for entry into Web-based collaboration, including infrastructure concerns, business application readiness and trust issues between trading partners. As these new business and organizational models evolve, what are the key factors your company must consider? Can it really promote higher sales or lower your production costs? IT leaders from several industries will share their successes and candidly discuss the pitfalls of B2B e-commerce in this interactive session.

11:30am - 12:15pm

Insider View: "Raytheon Corp.'s Unfolding E-Business Strategy"
Eric Singleton, Director of Global E-Business
Raytheon

12:30pm - 1:45pm
Interactive Luncheon with IT Leaders

2:00pm - 3:30pm

"Enterprise Security: Will Only the Paranoid Survive?"
Priscilla Tate, President
Technology Managers Forum

SECURITY

Moderator

Panelists:
Scott Charney
former head of computer crime investigations, U.S. Department of Justice and now Partner PricewaterhouseCoopers
Allan Paller
Columnist, Computerworld and Research Director, SANS
Tim Talbot, VP of Technology Management, PNH Vehicle Management Service

The costs of electronic attacks and security breaches are rising sharply, more than doubling each year into hundreds of millions of dollars. Every week, it seems, a new high-profile victim joins the list of companies that failed to protect themselves and their customers. Never have the business imperatives of secure commerce been so prominently in the spotlight. For IT leaders, the issues go beyond technical concerns. What are your company's legal liabilities when customer data is compromised? How do you get past political wrangling over budget allocations for security products? What are the questions you should be asking inside your own company -- or of your outsourcers or suppliers? This session will explore enterprise security in depth, drawing out examples, ideas and action items from our expert panelists.

3:30pm - 4:15pm

Afternoon Keynote: "Innovation & Change"
Thornton May, VP of Research
Cambridge Technology Partners

INNOVATION

4:30pm - 5:30pm
Premier Sponsor Breakout Sessions 1 and 2

5:30pm - 8:30pm
Expo Open and Reception/Buffet Dinner

Tuesday, June 20, 2000

8:45am - 9:00am
Remarks and Day Two Overview

9:00am - 9:45am

Keynote
David Lord, CEO
Toysmart.com

10:00am - 11:30am

"ASPs: The Double-Edged Sword of Outsourcing"
Mark Hall, West Coast Bureau Chief
Computerworld

ASPs

Moderator

Panelists:
Dick Hudson, CIO Global Marine
John Voeller, CIO, CTO & SVP Rank & Vesco
Sabeeh Lele, President Lele Consulting Group
Toni Gal, CIO, CTO & VP of Mergers and Acquisitions, GBS
Mark Mathias, President Eureka Digital
James Lubinoff, EVP Galileo International

This latest trend is both an option and an obstacle. As the application service provider market grows beyond the small to medium business space to take advantage of enterprise-class software, IT leaders are considering ASPs as a serious tool in their technology strategies. Yet will these outside vendors offer sufficient security for your IT operations? Can you control point product offerings from ASPs? How do you insure that ASPs deliver on service level agreements? Will today's high-flyers crash to earth and take your company with them? This panel session will nail down the critical success and failure points, and answer the most pressing and provocative questions that ASPs raise for IT executives.

11:30am - 12:15pm

Featured Speaker
Peter Solvik, CIO
Cisco Systems

12:30pm - 2:00pm
Buffet Lunch and Expo Open

2:00pm - 3:30pm

"Walking the E-Customer Tightrope"
Julia King, Senior Editor
Computerworld

E-CUSTOMERS

Moderator

Panelists:
Cathy Hotka, VP National Retail Federation
Joseph Smialowski Vice Chairman Fleet Boston Financial
Robert Rubin, CIO Elf Atochem North America
Manoj Tripati, CIO and Vice President Jamba Juice

Technologies such as data mining and customer relationship management software can put your company right in its customers' pockets, not only anticipating their current needs but discovering new ones. But where does e-business cross over that fine between customer knowledge into invasion of privacy? Does your company know how to walk this tightrope without falling off? What are the best strategies for leveraging and managing high-impact business data without alienating customers along the way? How are leading companies using technology to sustain old relationships while developing lucrative new ones? Does online customer service differ from the traditional approach? This panel session will explore the positives and the perils of the customer connection.

3:30pm - 4:15pm

Insider View: "Taking Care of E-Customers at Autobytel"
Ann Delligatta, COO
Autobytel.com

4:15pm - 4:45pm
Premier Sponsor Breakout Session 3

4:45pm - 6:30pm
Expo Open and Reception

7:00pm - 9:00pm

Premier 100 Awards Presentation and Gala Dinner
Featured Keynote: Jim Yost, CIO
Ford Motor Company

Wednesday, June 21, 2000

8:45am - 9:00am
Remarks and Closing Day Overview

9:00am - 10:30am

"How to Win the Hiring War Between the 'Dots' and the 'Nots'"
David Weldon, Careers Editor,
Computerworld

HIRING

Moderator

Panelists:
Irene Dec, VP of Institutional Investments, Prudential Insurance Co.
Margaret Schweer, HR Director Kraft Foods
Robert Bruce, CIO Allmerica Financial
David Foote, Managing Partner Foote Partners LLC
Jim Preve, CIO Green Mountain Coffee
Fran Quittel, Columnist Computerworld

Many traditional companies are reeling from the impact of the dot-com drainpipe, as sexy little startups pull top talent from their employee ranks. Beyond the stock options and the thrill of new ventures, what are dot-coms offering that your company may be overlooking? Are you talking about career development, or droning on about employee retention? How can you "steal" from your own staff in other divisions to enrich and strengthen the technology operation? What kind of employee referral programs really work? We'll hear from both sides of the debate in this lively, provocative discussion of hiring, head-hunting and holding onto the best IT people in a sizzling job market.

10:30am - 11:15am

Closing Keynote: "Putting All the Pieces Together: The E-Management Difference"
Peter Keen, Author, *The eProcess Edge*, and Chairman
Keen Education

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TECHNOLOGY

SMART PACKAGES

Motorola has developed an improved radio-frequency identification technology that promises to have applications in everything from inventory and checkout control to amusement park admission tickets. ▸ 64

HEALTH SPECS

Health information executives last week welcomed the launch of a coalition of 23 IT vendors and health care organizations that will define specifications for authenticating health-related transactions over the Web. ▸ 64

CRACKING THE CURVE

In one of the largest distributed computing efforts ever, 9,500 computers spent four months cracking the encryption method likely to be used to secure next-generation cell phones and other wireless devices. Experts are divided over what this means for the future of the technique, known as elliptic-curve cryptography. ▸ 65

QUICKSTUDY

See our tutorial on Web content-management systems, which label and track information that's placed on a site so the data can be easily located, modified and reused. ▸ 72

SPEEDY DELIVERY

Not all content-management services are created alike. They all aim to speed delivery of Web content to users, but you need to consider crucial differences in technology and architectural approaches when choosing one of these providers, users and analysts said. ▸ 65

IT OUTLOOK

Charles Wang, CEO of Computer Associates, answers *Computerworld*'s questions on security, e-commerce, IT and social change. He says he's worried that the perspective of the individual customer is being lost in the changing IT landscape. ▸ 68

WIN 2K MOVES TO SERVER APPS

Only weeks after launching Windows for Express Networks 1.0, Microsoft quietly rolled out another embedded operating system — this one based on Windows 2000. ▸ 69

SECURITY JOURNAL

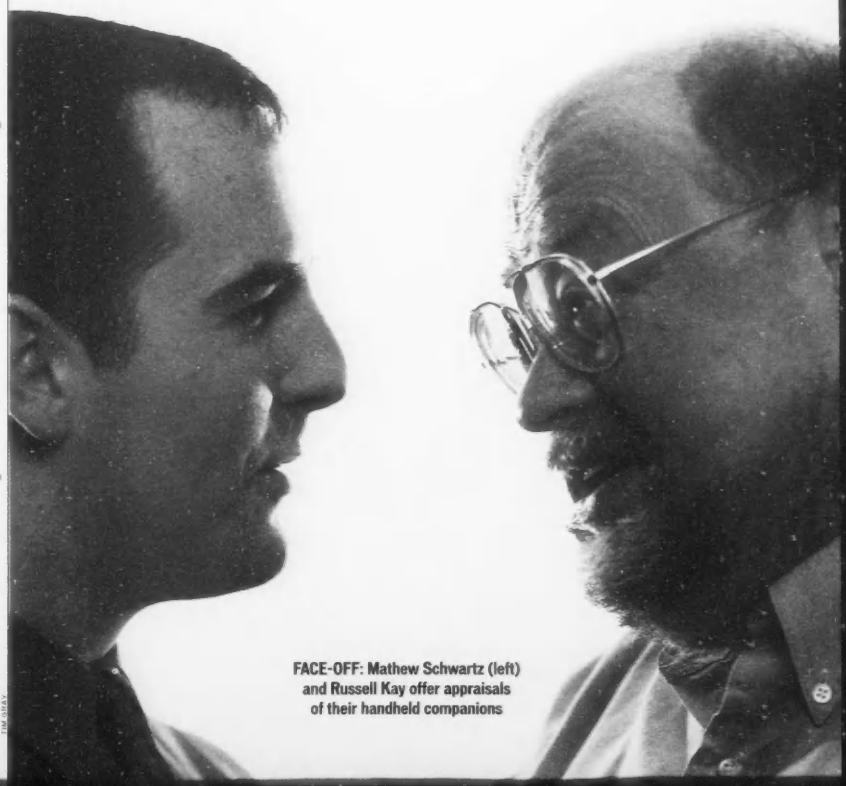
Week 7: Our fearless security manager is still looking for a batch file that will time-stamp his firewall logs, can't believe how hard it is to navigate some vendors' Web sites and lusts after a rack-mounted firewall implementation. ▸ 70

EMERGING COMPANIES

With secret shoppers, BuyerTouch adds the human sensibility to gathering and analyzing e-commerce site statistics. That capability may put this start-up ahead of its rivals. ▸ 78

MY PDA'S BETTER THAN YOURS

TWO REVIEWS EDITORS SQUARE OFF to debate the merits of their favorite personal digital assistant. In one corner, Mathew Schwartz, the Palm fanatic. In the other corner, Russell Kay, a recent Pocket PC convert. Two editors, two handhelds, one question: Which is the better machine? There are strong words from both sides. 74



FACE-OFF: Mathew Schwartz (left) and Russell Kay offer appraisals of their handheld companions

JIM GRAY

New Wireless Technology Promises Smarter Packages

Motorola's BiStatix labeling could enable anything printed to be tracked

BY RUSSELL KAY

JUST AS the optical laser scanner revolutionized grocery shopping, a new technology from Motorola Inc. promises to take that kind of identification and control to a new level, applying it to nearly anything that can be printed or have a label stuck on it. The basic idea is a new take on wireless, radio-frequency identification (RFID), a technology that's been around for years.

How It Works: Old Style

Until now, RFID systems have used the electrical property called inductance and have required the RFID tag — or transponder — to contain three elements: a metal coil antenna to generate electricity; a computer chip containing a radio transceiver, an analog-to-digital converter, memory and a processor; and a core of air or ferrite rod. Some tags also have their own batteries.

In operation, the RFID reader generates a low-level radio-frequency magnetic field that resonates with the tag's metal coil and capacitor, creating an electrical signal that powers the computer chip, which then transmits its stored data back to the reader. The process works well, but the tags are expensive — as much as $200 each. In recent years, that cost has fallen to less than $1 per tag, but that's still too expensive for all but high-priced items.

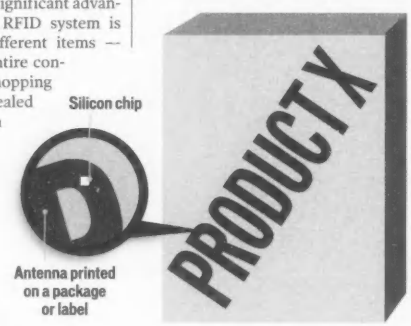
A Better Way

BiStatix, a new technology from Schaumburg, Ill.-based Motorola, changes that equation dramatically. BiStatix tags have only a silicon chip that's attached to carbon ink electrodes printed on the back of a paper label. Tags are printed by any known printing technique on standard printing equipment, and the electrodes can be virtually any size and shape.

The RFID silicon is simply attached to the printed substrate, with no need for a special interconnect. Thus, it can be put directly on a package during manufacture, or it can be added later.

BiStatix works on a capacitive coupling principle. A BiStatix reader/writer generates an excitation field that serves as both the tag's source of power and its master clock. The tag cyclically modulates its data contents and transmits it to the reader's receiver circuit. The reader decodes the data signal and formats it for sending to a host computer for further processing.

One of the significant advantages of any RFID system is that many different items — such as the entire contents of a shopping cart or of a sealed carton — can be read all at once and without requiring physical contact.



The BiStatix technology also has several characteristics that make it suitable for a wide variety of new situations and applications.

First, it's cheap. BiStatix uses an elegantly simple manufacturing process that can be implemented at the point of printing or paper converting. Conventional printing processes replace expensive coil-winding, stamping and etching. (Information on exact pricing was unavailable.)

Second, it can be incorporated into or applied onto almost any object. BiStatix is physically flexible and can be applied to corners, curved surfaces and odd shapes without danger of antenna breakage. Any nonconductive material can serve as a substrate. BiStatix chips are less than 250 microns thin (0.010 in.), with a surface area of less than 3mm.

Thus, they can be easily used in an unobtrusive manner. For example, a roll of preprinted, BiStatix-enabled tickets could be programmed and dispensed from a printer because the system's low profile and flexibility allow it to be used in roller-driven devices.

Third, the system is relatively indestructible in the short term — the substrate can be torn, folded, spindled or mutilated, and the tag will still operate properly. Because there isn't a capacitor to charge up, the tags can't be detuned. Tears, folding or punched holes won't make the BiStatix tags inoperable, as long as the chip remains intact. Tags can be read without a clear line of sight, and their readability is unaffected by moisture, dirt, dust or paint.

Finally, BiStatix tags have read/write capability, so that an existing stock of tags can be reprogrammed after manufacture or initial application. The data they contain can be changed, updated and/or locked.

Taken together, these traits make the new system well-suited for a wide variety of short-term, high-volume applications, ranging from supermarket inventory and checkout control to hotel keys, hospital patient wristbands, theme-park admission tickets and more.

'Smart Mail' Testing

The U.S. Postal Service has been experimenting with "smart mail," using BiStatix as an adjunct to bar codes for tracking individual pieces of mail en route by "smart-mail boxes" or for quickly locating a piece in a stack of envelopes or a warehouse full of packages. Luggage control and identification at airports is another area where BiStatix technology would be beneficial.

Web Coalition to Define Health Care Specs

It would help users prepare for HIPAA

BY JULEKHA DASH

Health information executives have welcomed the launch of a coalition of 23 vendor and health care organizations that will define specifications for authenticating health-related transactions over the Web.

In addition to heavyweights such as Intel Corp., Cisco Systems Inc., Sun Microsystems Inc. and Oracle Corp., members of the coalition — dubbed the 11.19 Working Group — include MedicaLogic in Hillsboro, Ore., VeriSign Inc. in Mountain View, Calif., and Aetna U.S. Healthcare in Blue Bell, Pa.

Gregory Miller, chief Internet strategist at MedicaLogic, said the coalition's efforts will enable health care organizations to verify the authenticity of the sender or receiver of electronic health information.

For instance, a pharmacy would be able to determine whether the person sending a prescription is a licensed physician.

Currently, health organizations use a variety of methods — including smart cards, passwords and biometric devices — to authenticate users.

Trust But Verify

The coalition's goal would be to establish digital credentials for medical professionals and create specifications so that various methods of authentication would be interoperable for transactions such as lab tests, claims submissions and pharmacy orders.

"Since there's no single dominant Internet health care company out there, these organizations [coming] together to determine [specifications] is really critical," said Scott Cebula, executive director of information services at Long Beach, Calif., health care provider MemorialCare. However, Cebula said, he would like to see some user representation in the coalition.

Miller said the 11.19 Working Group hopes to open membership to users by early next month and noted that two dozen health care providers have already expressed an interest in joining. The group also expects to publish a draft of its guidelines by next month, said Miller.

In Texas, Medical Center of Lewisville CIO Connie Salsman said the group's specifications would help health care organizations gear up for the Health Insurance Portability and Accountability Act (HIPAA).

Though the legislation has yet to be handed down in its final form, HIPAA will impose fines and possibly jail time for officials of health care organizations that don't adequately safeguard the privacy and security of electronic information.

"There has to be a way for the average user to know that what [the user is] doing is comparable" to what the HIPAA legislation will entail for users, said Salsman. "HIPAA will require a better way of authenticating [users]."

Network Cracks Mobile Encryption System

Wireless shown to be vulnerable

BY ANN HARRISON

After four months of number-crunching, a large, distributed network of computers worldwide has cracked an encryption method that will likely secure the next generation of wireless phones and other devices. The unprecedented effort revealed the strength of the encryption system but also highlighted some potential weaknesses.

"Just as crash tests by automobile manufacturers contribute to the safety of cars, this experiment helps improve cryptosystems being deployed to secure electronic communications and commerce," said Daniel de Rauglaudre, a research engineer at the French National Institute for Research in Computer Science and Control (INRIA), which announced the results last week.

Irish mathematician Robert Harley and three INRIA colleagues, including de Rauglaudre, revealed that a brute-force collaborative effort by 9,500 computers on the Internet had found the 109-bit key that had been used to scramble a message. The message was encrypted using elliptic-curve cryptography (ECC), which calculates the number of points on a curve and uses that information to generate keys that secure data.

Keys Have Size Advantage

ECC could be useful for mobile devices built around processors with less power than those found in PCs, because the algorithms require less computational power to encode and decode data.

Many software vendors use 1,024-bit RSA keys in their secure applications. But Rohit Khare, president of the security research group 4K Associates in Irvine, Calif., noted that ECC keys can be up to 100 times faster and five times smaller than RSA keys. He added that ECC keys used in digital certificates for cell phones can allow those devices to securely carry digital wallets containing credit-card information. "It's very important to find faster and smaller encryption codes, and this demonstration shows that elliptic-curve technology that can be a fraction of the size and done much more quickly on more limited computers is just as strong," said Khare.

The search for the 109-bit key was sponsored by Certicom Corp., a cryptographic company in Toronto that wanted to encourage researchers to test the security of ECC. The search challenge, known as ECC2K.108, was solved by what appears to be the world's largest network of distributed computing power. The effort, which was completed on April 4, included 1,300 volunteers in 40 countries who tried every key combination until they found one that worked. According to the INRIA, two-thirds of the computation was done on Unix workstations and one-third on Windows PCs. On a single 450-MHz machine, it would have taken an estimated 500 years.

WHAT IT MEANS

Elliptic-curve cryptography (ECC) *calculates the number of points on a curve and uses this mathematical information to* **generate keys** *that secure data. To improve security, arbitrary curves are picked at* **random** *and changed frequently. But most cryptosystems use fixed curves that have* **particular properties** *that make keys easier to generate. The elliptic-curve challenge showed that these properties could potentially* **endanger security.**

The project used open-source software that Harley developed to calculate more than 2 million billion points on a type of elliptic curve called a Koblitz curve, which was used by Certicom. Of these points, 2 million "distinguished points" were sent to an AlphaServer at INRIA, where a Web site allowed participants to follow the effort's progress in real time.

"The amount of computation we did is more than what is needed to crack a secret-key system like [Data Encryption Standard] and enough to crack a public-key system like RSA of at least 600 bits," said Arjen Lenstra, vice president of the corporate technology office at Citibank in New York and a participant in the project.

Strengths and Weaknesses

But the project highlighted the relative weaknesses of some curves with special properties and confirmed that random curves are best for optimal security. Harley noted that the computation was only about one-tenth of what normally should be required to crack a 109-bit curve because Certicom chose a curve with properties that helped speed up the attack. "This underlines the danger of adopting particular curves and the need to pick random ones with no special characteristics," Harley said.

Lenstra pointed out that RSA still has the advantage over ECC because RSA keys are less cumbersome to generate and companies like Certicom are not willing to share information on their curves. "There are many mathematicians who are still concerned about the security of elliptic curve," said Lenstra.

Despite concerns, there is still confidence in the strength of ECC. Khare noted that ECC has been written into the new Wireless Application Protocol standards as an optimized version of the Wireless Transport Layer Security protocol, formerly known on the desktop as the Secure Sockets Layer standard. He pointed out that wireless software developers such as Phone.com have already shipped software with ECC to handset manufacturers and that its deployment is just a matter of carrier rollout.

Content-Delivery Services Vary in Their Approaches

Look before you leap, say analysts

BY JAIKUMAR VIJAYAN

Not all content-delivery services are created alike. They're all aimed at speeding delivery of Web content to visitors, but there are crucial differences in technology and architectural approaches to be considered when choosing a provider, users and analysts said.

"You need to understand what your bandwidth usage patterns are" now and in the future, said Chris Doell, CEO of Sportstalk.com, a Palo Alto, Calif.-based sports Web site. Also crucial are factors such as a service provider's performance-monitoring and reporting abilities and the demographics of visitors to a Web site, he said. Signing up with a service provider that has a global reach makes little sense, for instance, if most of your users are from North America.

Content delivery services are becoming increasingly popular as Web-site performance becomes a key issue. Such services cache frequently accessed static content — such as images and graphics — on distributed servers that are closer to the Web user than is the original server.

Moving content to the "edge of the network" reduces the congestion on a content provider's primary site and reduces the time taken for a Web page to be served to a user.

Studionext.com Corp. in Woodbridge, N.J., for example, was able to significantly boost the speed at which its video content was served by using Akamai Technologies Inc. as a content-delivery provider. The move "allowed us to save on end-to-end infrastructure costs," while improving performance, said David Wu, CEO of Studionext.com.

"The fundamental value of all these providers is the same," said Greg Howard, president of The HTRC Group LLC, a San Andreas, Calif.-based consultancy. But there are some core differences in technologies, business approaches and scale, he added.

For starters, there are two approaches to delivering such services: facilities-based and multinetwork services, Howard said.

Facilities-based providers such as Digital Island Inc. in San Francisco, Exodus Communications Inc. in Santa Clara, Calif., and other major telecommunications companies own and operate their networks and data centers.

Such companies make sense for users who want providers that can offer Web, application hosting and other outsourcing services in addition to content delivery, Howard said.

Multinetwork providers such as Akamai in Cambridge, Mass., and Adero Inc. in Boston place their own servers in as many backbone networks as possible. The focus is more on users who are looking mainly for content-related services and not so much for outsourcing.

And there are differences among multinetwork providers as well. Adero, for instance, has deployed 115 large Unix servers on multiple networks to cache static, or unchanging, content. The servers also mirror and host portions of customer applications that will allow Adero to serve up dynamic, or fast-changing, content faster to Web users.

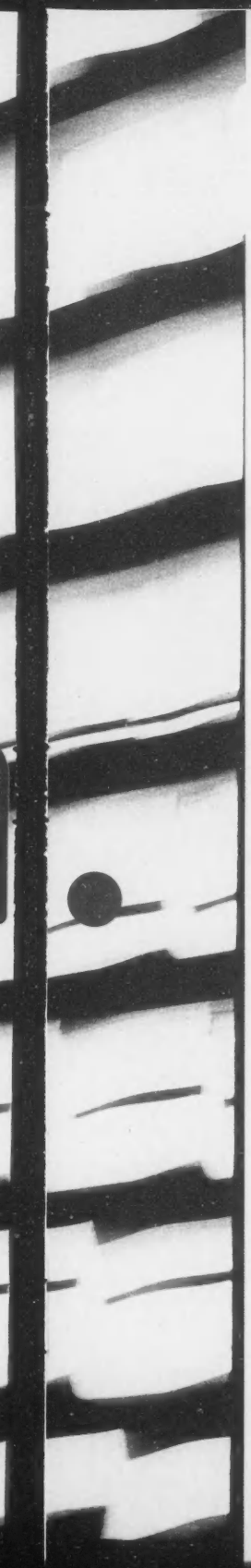
Akamai, which is one of the biggest companies in this space, relies on a network of 3,000 Linux servers worldwide to cache and deliver content.

Unlike some content providers that tend to route data over the shortest path, Akamai uses routing and caching software to examine the state of the Internet at the moment and find the fastest — not necessarily most direct — route to the user, said Jeff Young, a marketing manager at Akamai.

Mirror Image Inc. in Woburn, Mass., is setting up large data centers worldwide complete with mainframe, multiterabyte storage facility and high-end Unix server technologies. The data centers will act as sort of regional hosting sites for content providers, serving up a wide variety of content.

Others such as Epic Realm Inc. in Richardson, Texas, are targeting the company's services mainly at e-commerce sites. A core differentiator for Epic Realm is its ability to deliver "perishable content," said Keith Lowery, the company's chief technology officer.

I am data



I am data.

Yesterday I was just numbers on paper.

Today I am the lifeblood of business.

I am the genetic material

that flows between companies

to create products,

deliver service,

build companies,

enhance life.

And I am forever

committed to commerce.

Who is committed to me?

We're investing 6 billion dollars in the most far-reaching deployment of broadband out there. We're one of the largest network integrators, and a provider of advanced, global eCommerce solutions. We're SBC. The combined strengths of Ameritech, Pacific Bell, Southwestern Bell, SNET and now Sterling Commerce. You're demanding more. **Start expecting more.**

SBC

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Computer Associates CEO on IT's Changing Landscape

BY SAMI LAIS

On the eve of last week's CA-World 2000, Computer Associates International Inc.'s annual conference, CA President and CEO **Charles B. Wang** *talked with* Computerworld *about e-commerce, the changes it is making to the economic and social landscape and CA's role in managing the e-commerce infrastructure.*

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it's the software, baby.

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Q: There's a gap between the reality and public perception of privacy and security and what's being done to ensure them. How do you address that gap?

A: Security and privacy are very important on the Web. People have seen what has happened, have an idea of what can happen. People think [February's] denial-of-service attacks were something really sophisticated. Forget it. They were nothing compared to the real harm that could be done.

Is there any way ultimately to protect all of this? Probably not. But it is something that we can continue to work on. This is like a war. Offensively, new [hacking] tools will be developed — they're available on hacker sites. Defensively, there'll be new fixes.

The software exists to stop denial of service. But it obviously wasn't applied at those sites that were attacked.

Q: What can the information technology industry and Internet service providers do about risks in business-to-consumer e-commerce?

A: We have all the technology. It depends on the company and how they want to protect themselves and their customers. They are at risk. If a cable company does not recognize that and [won't] do something about it, their networks are wide open.

My mother has a credit card she uses only on the Web. She's only used it on sites that say they're secure, but three times so far things have started showing up on her account that she didn't charge, and we've had to shut down the account. Obviously there's a risk.

The world we live in and the marketplace we deal with are expanding so rapidly that you can make all of these mistakes and they're hidden by the expansion rate. The individual experience gets lost. You and I may buy things on the Web, and it's not a good experience, so we say we're never going to that site again. Meanwhile, in just the last two hours, another 100,000 people signed up to get on the Web.

[For dot-coms], it's a mad search for as many customers as they can get. [Dot-coms say:] "I gotta service as many of these as I can as fast as I can because I want to be the one who says I've got a million subscribers. Because I'm going to be judged by how many subscribers I have, not by how much money I'm making. So what if I lose 100,000 [potential customers]? I just got 2 million more."

Q: IT – and software such as yours – is at once the result of and the instrument of economic change and the social change it causes. What responsibility does the maker of software have?

A: I look at it differently. In the past, IT's been used mostly for accounting — and today, most of IT is still used for accounting — but we are changing that.

> IT could be seen as the big empowering tool. But most of the world still doesn't have it.
>
> CHARLES B. WANG, COMPUTER ASSOCIATES

The telephone changed so much of how we live, yet today, half the world still doesn't have access to telephones. What has it changed for them? IT could be seen as the big empowering tool. But most of the world still doesn't have it. The Internet is bigger. It's changing the way we do business, changing the way we communicate, changing the way we relate. It's making social changes.

But all of IT is only a tool. It's our responsibility that we never forget that, that we don't start to drive our children to think that the virtual world is the only world or that it's more exciting than the real world.

Q: Where do the best IT initiatives come from?

A: Where it works best is when business and IT work together. Where it fails miserably is when they don't.

If [the initiative] comes from the business side, then there's often no integration with the rest of the business process, because the IT side still holds all the back-office information.

If it's only driven by IT, business people will never accept it. [Development won't be] fast enough. Because IT people will always tend to rebuild infrastructure. That's their business. The bigger the company, the more people they have rebuilding it.

If you or I want to go to the airport, we go downstairs and get in a car and go to the airport. Ask a technical person how to get to the airport, and he will tell you how to build a car. They take a transportation problem and turn it into a manufacturing problem. The largest companies in the world shouldn't be the ones to find the best IT builders. They should find the best IT drivers.

Windows 2000 Migrates Into Web-Hosting Appliances

BY DOMINIQUE DECKMYN

Microsoft Corp. has been quietly preparing to snatch a piece of the fast-growing server appliance pie, a market that has become Linux's steady diet.

IBM and Dell Computer Corp. have announced Web-hosting appliances that use a modified version of Windows 2000. They are single-function servers that can be installed in minutes rather than hours.

Last month, Microsoft introduced Windows for Express Networks, an operating system for server appliances based on Windows NT Embedded 4.0. But the Dell and IBM units run a special version of Windows 2000. According to Ryan Waitt, Microsoft's lead program manager for server appliances, the enhanced reliability of Windows 2000 makes it better-suited as a Web server.

The operating system has been tailored to the hardware for faster performance, Microsoft claimed. The license won't allow buyers to run applications such as SQL Server.

Some users doubt whether Windows is a good choice for a server appliance. "It's going to be a lot less efficient than Linux or OpenBSD," because they are inherently more modular, said Fred Leakeas, information systems operations manager at Intermountain Gas Co. in Boise, Idaho.

But Jim Gargan, director of strategy and product marketing for Netfinity servers at IBM, said Internet service providers and application service providers demand Windows, partly because they already use NT to run Windows-based hosted applications.

Running Windows 2000 on an appliance is more expensive than running Linux. For instance, the top-of-the-line Dell PowerApp.web server model with a 700-MHz Pentium III processor costs $5,298 when running Red Hat Linux 6.2 and Apache. The same model running Windows 2000 costs $5,698.

CA Integration of Sterling Delayed

BY SAMI LAIS
NEW ORLEANS

Computer Associates International Inc. earlier this month said it has delayed integrating newly acquired Sterling Software Inc. into CA products because the deal was finalized too close to the start of the annual CA-World 2000 user conference, held April 9 through 14.

And in an unrelated development, integration of Dallas-based Sterling's services staff into Islandia, N.Y.-based CA's newly reorganized field operations divisions was put off two or three weeks, according to CA officials.

"Issues on the technical side are fairly straightforward," said Ron Exler, an analyst at Robert Frances Group Inc. in Westport, Conn. "The real challenge will be in retaining the people. They wouldn't have trouble finding other jobs if they're not happy with how things go."

CA President and Chief Operating Officer Sanjay Kumar last month said the company planned to "get to CA-World with the integration done and the [applications] rockin' and rollin'." But the U.S. Department of Justice approval on the deal came less than two weeks before the conference.

Integrating the tools will take time, Exler said. Where there is overlap, "CA will pull the best product features into the primary offering, whether that's a CA product or a Sterling product," he said.

Plans for many Sterling products were posted at *www.ca.com/sterling/roadmaps* (see chart below). But plans were unavailable for the Sterling VMS product family, which includes backup, tape, monitoring, security, accounting and scheduling tools — all of which have equivalent CA products.

Fate of Sterling Software Tools

▸Electronic business intelligence
Eureka portal software: Stand-alone, with added Jasmine ii, Platinum repository, Neugents
VISION database tools: Integrated into Erwin
VISION:Classic query and reporting tools: Stand-alone
SAP Productivity suite: Stand-alone, with added Neugents and Platinum repository

▸Application development
Most of COOL family: Stand-alone, with added Jasmine ii, dynamic personalization via Neugents and Eureka technology; also integrated into Jasmine ii
COOL:DBA and COOL:Business Team: Integrated into Erwin

▸Storage management
IntelliSAN storage-area network software: Stand-alone with added checksumless virtual backup, and integrated into CA software
Vantage storage management: Stand-alone, with added Neugents
LifeGuard remote mobile backup: Stand-alone
Alexandria backup and restore: Stand-alone
SAMS:Disk and SAMS:Vtape for OS/390: Stand-alone

▸Network management
SOLVE:Netmaster OS/390 products: Stand-alone

▸Automation
SOLVE:Operations family: Stand-alone, with added Sysplex-enablement, automated-workload balancing

▸Help desk
SOLVE:Central Help Desk: Integrated with Service Desk

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TRIM ALONG PERIMETER TO COLLECT AND DISPLAY NEAR NEEDSAKES OF CONSIDERABLE SIGNIFICANCE.

Enduring Web Site Tricks, VPN Phobia

Week 7: Looking for a batch file to date-stamp firewall logs; still cursing at kludgy vendor Web sites

Security Manager's Journal

BEING ORGANIZED is highly overrated, but it's something that we *must* learn as security administrators and engineers.

My office still looks like a tsunami hit it, even though I have new furniture and I try to organize my piles of paper and notepads. It bothers me that my boss keeps only one magazine, one notebook, a computer mouse and a keyboard on his desk. He pushes more paper than I do, so I'm trying to figure out how he keeps his office so clean. The lack of cleanliness in my office is starting to bleed over onto my network drives. I'm gathering so much that I don't know how to organize it all.

Last week, we had some misfortune with our lab firewall — a .bat file deleted all the executables in the %system%\fw\bin directory. I rebuilt the firewall and found time to work on the .bat file. I need something in Windows NT to date-stamp the logs to process them daily. If you know how to set an environment to date-stamp a file or how to name the file with the date it's run, e-mail me at pat_rabbinski@hushmail.com.

So far I have switched the logs and exported them in comma-delimited format in Microsoft Corp.'s Access to look for hacks or unauthorized usage. Then I stopped the firewall daemon, deleted the old log in the fw\logs directory and restarted the daemon. That clears the log buffer. FW-1 will automatically create new logs.

I set the AT Scheduler in the Windows NT Resource Kit to run this job every night at midnight. After the firewall daemon starts, another .bat file is run to send the exported logs to my internal server via file transfer protocol (FTP) so I can review the logs.

As Bad as Calculus

Tuesday was pretty boring. I tried to load Windows 98 on an old 760ED IBM ThinkPad to begin testing the virtual private network (VPN).

It looks like I'm going to be asked to implement a VPN soon. I'm having a hard time understanding this. The challenge is that you have to authenticate your session. Then you have to decide if you want to encrypt it, then you have to decide if you want to encrypt the authentication and then highly encrypt the session. Note to self: Quickly learn quantum mathematics, calculus and any other difficult math so I can get this all straight!

I went to Check Point Software Technologies Ltd.'s Web site via FTP to get the SecuRemote Client piece.

At Check Point's site, there are about 20 different SecuRemote clients to download and no documentation. Shame on you, Check Point. You should always tell people what you have and what they need to download. Now I have to e-mail my vendor and wait for a reply and e-mail the help line for Check Point's authorized training center just to see who will answer first.

While I am waiting, I plow through the demo book of the FW-1 class I just took. They had some labs of how to set up the SecuRemote. I went through the worksheet, generated my keys, configured my user account and created two rules in the firewall, one for authentication and the other for the encryption/VPN tunnel.

Later, I finally got an answer about which one to download, so I grabbed it and started the laptop. After installing the client, I connected to a generic dial-up Internet service provider. Then I launched SecuRemote, typed in the name of the firewall and hit Get. It grabbed the correct IP address of our firewall — so far so good. Then I hit the connect button. After a minute or so of watching the RX/TX lights, a window popped up to say the host didn't have the proper license for the VPN. However, I knew we had the VPN+DES+Strong version of FW-1; we had just renewed our license and the company said it was licensed for SecuRemote.

On Wednesday, I had a conference call with Entrust Technologies Inc. in Plano, Texas. The company provides software to create Certificate Authority servers and encrypt e-mails, desktops, laptops, whatever you want. It looks pretty neat, and the company said it integrates wonderfully with Windows 2000. Of course, you have to take what a salesman says with a grain of salt and then consult with either his tech support person or another person you trust. The other problem is that this stuff is deadly expensive — like $30,000 to start just for the software. Let's not forget that we will also need another server/workstation to run this software plus the yearly support and upgrades. We'll talk later about Entrust.

I Want My Nokia

The best is yet to come: I was able to go to a demonstration of Nokia Corp.'s IP 440, a rack-mounted unit that combines high-performance IP routing with a complete implementation of Check Point's FireWall-1 enterprise security suite. This is what I really want to buy next. It runs a very slimmed-down version of FreeBSD; I was told that 700KB was the total size of the FreeBSD operating system. The IP 440 can be configured with up to four four-port Ethernet cards and a Channel Service Unit/Data Service Unit if you want to plug a T1 line or frame relay directly into it.

I got to configure it right out of the box. I plugged a serial cable into it, then connected the other end to a laptop and began a Telenet session. After inputting a username and password, I assigned an IP address to the first Ethernet port. Then I connected a crossover cable from my laptop to the first port on the 440. I launched Internet Explorer 5.0 and went to the address I had assigned and found I can configure the rest of the 440 through a browser. It even provides a back-up system and FTP server so that you can back up your configuration and FTP it to another server.

So, if anything were to happen, I would simply reload the operating system and FTP over the backup, do a restore and be back in business.

Back in my office, I met with RSA Security Inc. about the SecureID authentication system for our network team. We should have stronger authentication than simple passwords, given that we hold the keys to the kingdom. More on that next week. ◗

THISWEEK'SGLOSSARY

Authentication: Confirming the identity of a user requesting system access.

Check Point SecuRemote: Check Point's VPN-1 SecuRemote extends the corporate virtual private network to the desktop and laptop.

Certificate Authority: A package of data digitally signed by a trusted authority, which binds a public key to an owner.

Data Encryption Standard (DES): Encryption technique that scrambles data into an unbreakable code for public transmission.

Channel Service Unit/Digital Service Unit (CSU/DSU): A pair of communication devices that connect an in-house line to an external digital circuit such as a T1 line or AT&T Corp.'s Datophone Digital Service.

Encryption: The conversion of data into a secret code for transmission over a public network.

Virtual private network (VPN): A wide-area communications network provided by a common carrier that provides what seems like dedicated lines to users.

LINKS:

www.checkpoint.com: Home page for Check Point Software Technologies, with information about its firewall, VPN and other security products.

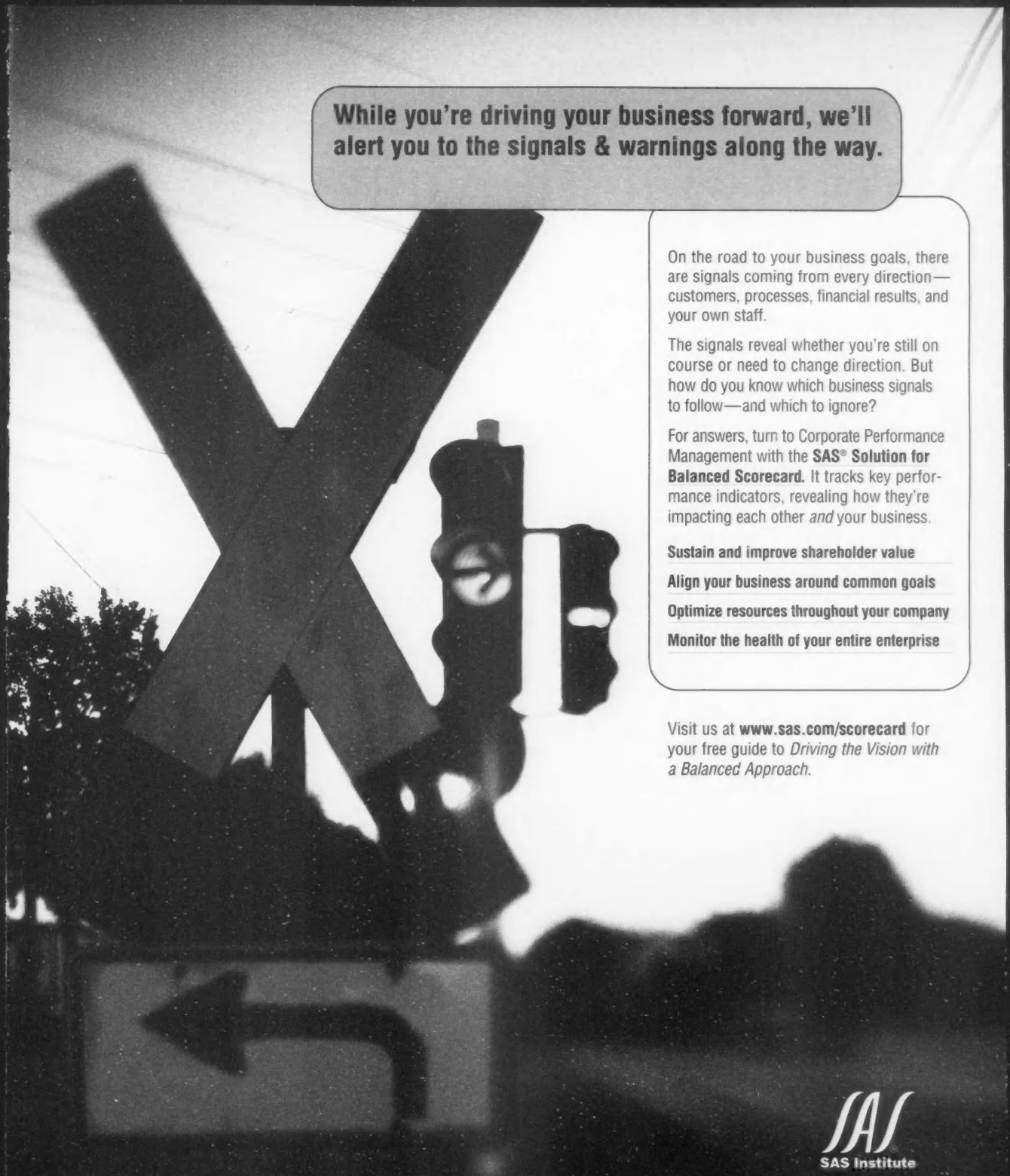
www.computerworld.com/home/online9697.nsf/all/971006
vpnlinks: *Computerworld*'s research links for information about virtual private networks.

www.computerworld.com/home/print.nsf/all/000327ce16: A *Computerworld* QuickStudy article about authentication.

www.iprg.nokia.com: Links to information about IP security products from Nokia.

www.entrust.com: Home page for Entrust Technologies, with information about its public-key infrastructure, cryptography and other security products.

■ *This journal is written by a real security engineer, whose name and employer have been disguised for obvious reasons. It's posted weekly at* www.computerworld.com *and at* www.sans.org *to help you and our security manager — let's call him Pat — better solve security problems. Contact Pat with comments or advice at pat_rabbinski@hushmail.com, using "Pat's Journal" in the subject line.*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On the road to your business goals, there are signals coming from every direction—customers, processes, financial results, and your own staff.
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Web Content Management

BY CYNTHIA MORGAN

IMAGINE A LIBRARY without the Dewey decimal system, and you'll have a pretty good idea of the chaos that is a large Web site. Content-management systems can tame that chaos by cataloging Web page data for quick and efficient tracking, editing and reformatting.

HTML, the basic language of the Web, simply describes how text, graphics and other data should be presented on a Web screen. It doesn't describe the data itself and offers little help when a webmaster needs to locate and modify particular documents. HTML by itself is static; once the page is posted to the Web, it must be modified off-line and reposted in order for any changes to take place.

Power to the People

But the real power of the Web is its ability to move new information to the customer in near-real time and to customize that information to suit individuals. That customization, known in the Web world as individualization or personalization, is virtually impossible with static HTML pages, especially with the ongoing shortage of trained Web technicians. It's hard enough to create every Web page once, let alone regenerate that same page every time a change is needed. You'd need an army of Web page producers to create the custom pages of, say, Amazon.com Inc., which presents data based on customer preferences and past buying.

Dynamically generated Web pages, however, give Web site managers the ability to create a Web page once and then pour information into the page many times. Dynamic Web page generation lets Web technicians create an overall template once, with fields for customer-specific information. Then servers can pour specific data into the template to create individualized pages on demand.

Content management marshals information into labeled buckets of data that can be used again ("repurposed") or quickly updated to reflect information without needing human attention. At its simplest, Web content management resembles a word processor's mail-merge function that can mass-mail thousands of form letters, each containing customer-specific data.

DEFINITION

Web content-management systems label and track information that's placed on a Web site so that it can be easily located, modified and reused. These systems are a critical component in personalizing Web pages for site visitors.

The theory behind most content-management applications is simple: You build a set of Web page templates, hook them up to a content server, add a back-end database of information and attach the whole thing to a Web Server. The content server automatically pulls information from the database, wrestles it into appropriate formats and stuffs the correct data into templates, generating new and updated pages automatically. Employees with little or no Web training can update content directly without ever touching a Web page. They simply enter information into database forms.

Dynamically generated Web sites are more likely to be up-to-date and consistent in presentation. Design changes can propagate rapidly and automatically throughout an entire site. And most content-management systems include a workflow system that routes data automatically from creator to editor to approver. They can often lock unauthorized users out of the creation and edit cycle and provide an audit trail for error tracking and version control that allows users to return to a previous version of the site.

Most content-management systems support tagging structures that allow content reuse without manual reformatting. XML, the best known, uses an HTML-like structure to describe the data on a page. Content-management systems also generally employ scripting languages such as Tool Command Language and JavaScript.

In practice, content management can be difficult and expensive. Developing an effective content-management system for a large Web site takes a great deal of expert customization, especially in building scripts to handle data flow and in constructing effective templates. Each new type of Web page requires new templates and workflow scripting, which can block innovation.

Large organizations with hundreds of thousands of Web pages often have multiple Web sites, each with different needs, data, formats and locations. Pre-existing Web sites must convert thousands of pages to the new content-management system.

The problem grows even worse when organizations exchange data destined for Web sites. XML needs additional data descriptions, called tags or document type definitions (DTD), to adequately define the content of most documents. DTDs tend to be subject-specific and aren't easily passed between organizations.

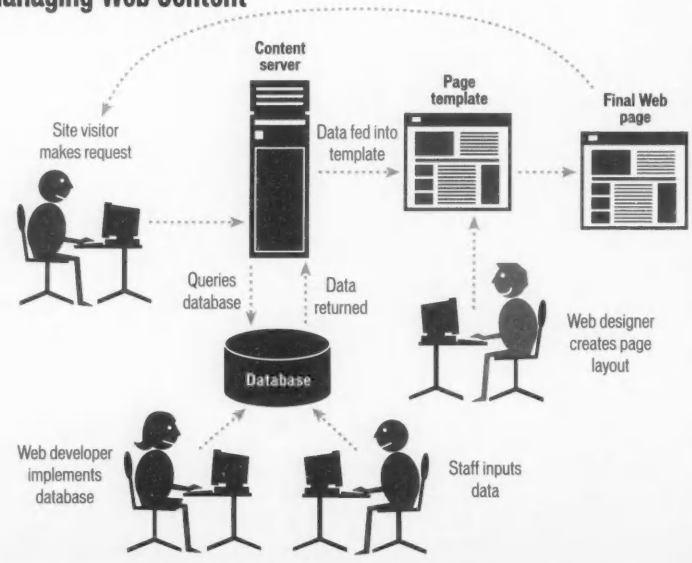
ICE Is Cool

Many of the standards built around XML are still in flux. However, the Information and Content Exchange (ICE) protocol is specifically designed to alleviate many content-management and data-exchange problems. (To learn more about ICE, go to *www.w3.org/TR/1998/NOTE-ice-19981026.*)

First recognized by the World Wide Web Consortium in 1998, ICE describes how managed content should be passed between Web sites. It provides a common vocabulary of terms and methods for exchanging data using XML. It will be especially useful in creating syndicated content — information leased or sold to multiple Web sites — with a minimum of translation hassles.

The first version of the standard was proposed by leading content-management developers, including Microsoft Corp., Sun Microsystems Inc., San Jose-based Adobe Systems Inc. and Austin, Texas-based Vignette Corp. It applies specific formatting rules to virtually any kind of data that can be presented on a Web site, even down to mundane items such as date and time.

Managing Web Content



Morgan is a freelance writer who specializes in high-technology issues.

■ *Are there technologies or issues you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.*

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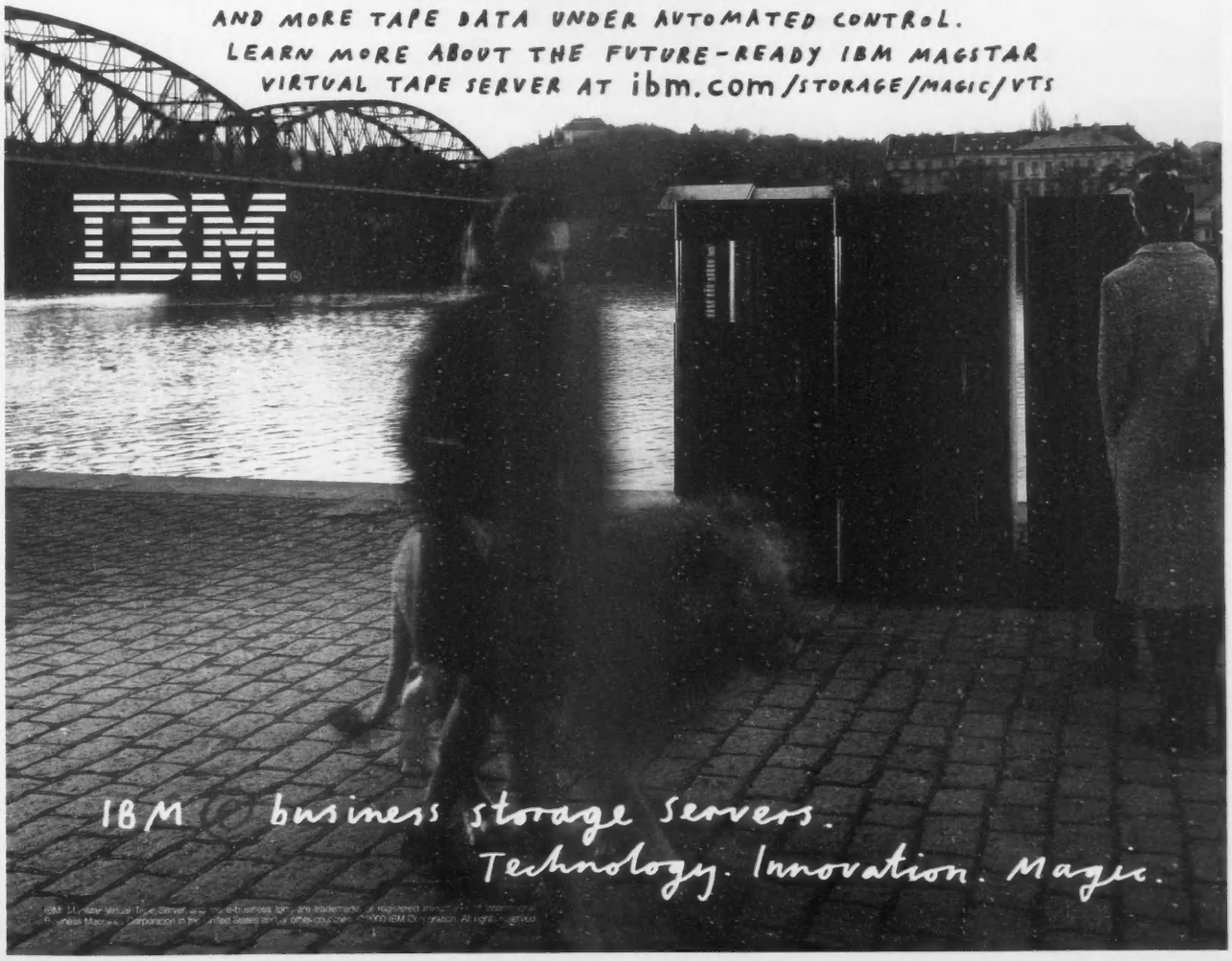

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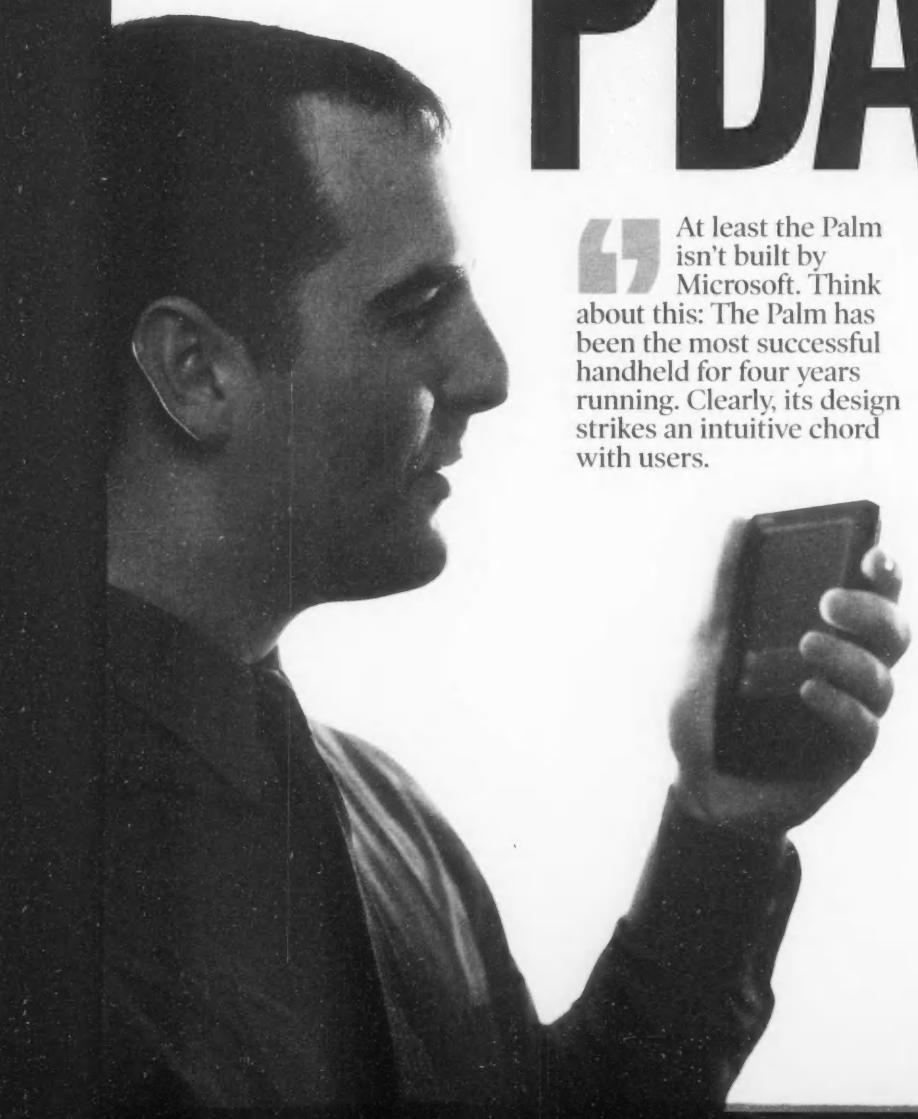
In this corner, a Palm fanatic. I convert. Two editors, two hand better machine? By Mathew Sc

PDAs at 3



> At least the Palm isn't built by Microsoft. Think about this: The Palm has been the most successful handheld for four years running. Clearly, its design strikes an intuitive chord with users.

SENIOR EDITOR Mathew Schwartz is a Palm fanatic who swears by his new, monochrome Palm IIIxe (from Palm Inc. at a street price of $215). Senior reviews editor Russell Kay, a recent convert to the Pocket PC, much prefers his Jornada 545 (from Hewlett-Packard Co. at an estimated street price of $499) and its Windows CE 3.0 operating system from Microsoft Corp. *Computerworld* asked these two for a calm, balanced appraisal of their handheld companions. Instead, they made passionate arguments, but each failed to convince the other.

BACKGROUND

Schwartz: First, some ground rules, Russ. If I buy a gadget, I have two guidelines: Will I carry it? Will I really use it? When I first checked out handhelds by talking to friends and searching online, I picked the Palm. After a year, that device still satisfies my two criteria, and it's great at keeping me organized.

I've looked at the new Pocket PC devices, and they just don't meet my requirements. They're too big, and their operating systems are a pain. I don't care how much memory they have or about playing MP3s. I want something inexpensive to keep me organized. The proof is in the pudding: For more than a year, I've used the Palm religiously, tracking phone numbers, appointments, story ideas and movie times and even writing stories on it using the portable keyboard. The Palm still beats the Pocket PC in just about every category I find useful.

Kay: Will I carry it, and will I really use it? Those are great questions, Mat, but my answers are different. I also carried a Palm for more than a year, and it was no more useful to me than the $30 organizer it replaced. In fact, it was harder to use in low light. I stopped carrying the Palm.

POWER ME THIS

Schwartz: Two words, Russ: battery life. My Palm IIIxe goes for more than six weeks on two AAA bat-

PHOTOGRAPHS BY TIM GRAY

n the far corner, a recent Pocket PC
dhelds, one question: Which is the
chwartz and Russell Kay

30 Paces

teries. No recharging, no fuss. Even with the color Palm IIIc, which has built-in rechargeables, I got more bang for my buck. The Pocket PC only lasts a matter of hours, especially if you're playing MP3s.
Kay: But what good is long battery life if you can't read the damn thing? And comparing monochrome with color battery life doesn't wash; you have to compare color vs. color.

SOUNDING OFF

Schwartz: Batteries aside, the Pocket PC has a fatal Microsoft flaw: It's bloated! The Palm does a few things very elegantly. The Pocket PC tries to be everything — and you pay for that functionality even if you don't use it. For me, the Pocket PC's dictation feature is worthless. I never transcribe voice notes.
Kay: I don't record interviews on my Pocket PC either, but it's great for capturing directions or quick notes to myself.

PALM PLAYS WELL WITH OTHERS

Schwartz: Out of the box, I had my Palm set up with free synchronization links to my favorite e-mail program, Eudora, and to the Palm desktop program that lets me type appointments and memos into my PC and sync them with my Palm.

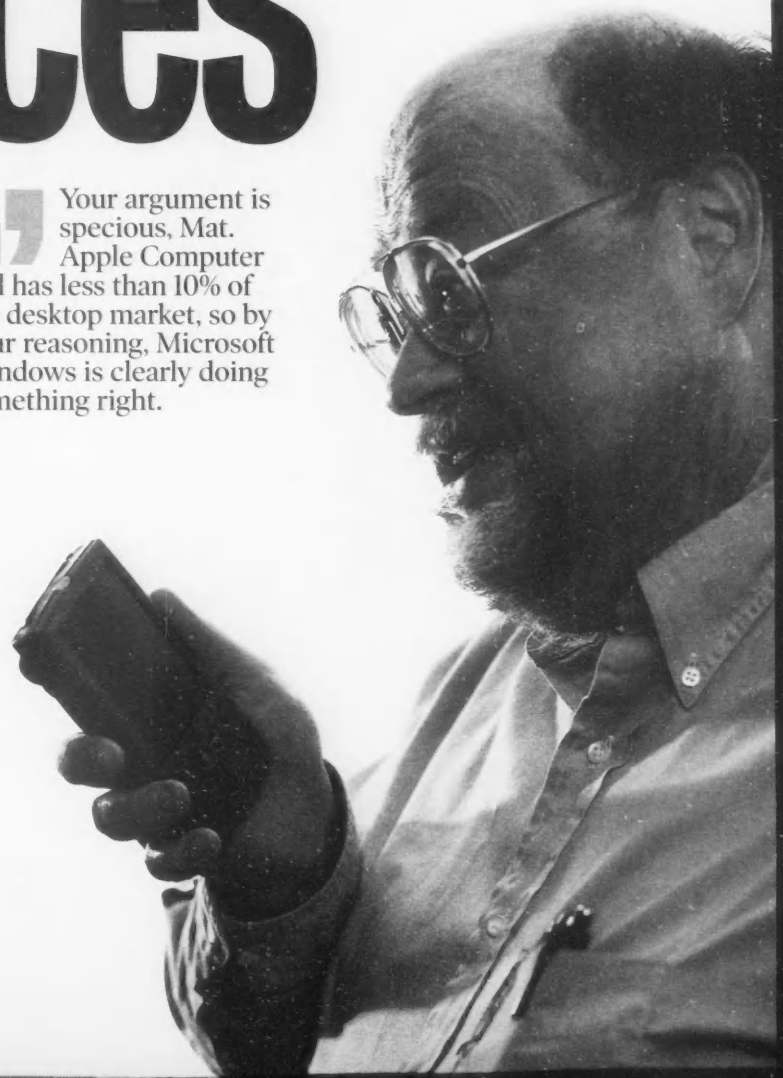
Guess what? This isn't the world according to Gates. I can't stand Outlook, but it's the only organizer the Pocket PC integrates with out of the box.
Kay: Sure — out of the box. I'm not crazy about Outlook, but I don't like Eudora either. Just like the Palm, there's lots of third-party software for the Pocket PC — and it's from the same companies that write connectivity applications for the Palm.

HARD-CORE FANS

Schwartz: At least the Palm isn't built by Microsoft. Think about this: The Palm has been the most successful handheld for four years. Clearly, its design strikes an intuitive chord with users. Yet after suc-

Continued on page 76

> Your argument is specious, Mat. Apple Computer still has less than 10% of the desktop market, so by your reasoning, Microsoft Windows is clearly doing something right.



PDAs at 30 Paces

cessive versions of Windows CE, Microsoft still has less than 10% of the handheld market. Palm is doing something right.

Kay: Your argument is specious, Mat. Apple Computer still has less than 10% of the desktop market, so by your reasoning, Microsoft Windows is clearly doing something right on the desktop, something that "strikes an intuitive chord with users."

Schwartz: And there's the Palm's cult-like following.

Kay: Geez, Mat, first you complain about Microsoft, then you brand the Palm as a cult object.

Schwartz: Yeah, but what about when you want to add a particular function to your Palm? Odds are good that someone else has already built a solution, one you can download. And thousands of other users are out there trying the same program.

Kay: This sounds an awful lot like the open-source debate.

Schwartz: Power to the people, Russ. Heaven forbid that Microsoft should let users reshape an application for their own ends. I can show you a passionate Palm user base that creates the programs it needs. Consider Aportis Technologies Corp.'s BrainForest, a third-party to-do and list program that puts Microsoft Word's outlining function to shame. The Palm gives you options. Competition creates excellence.

Kay: It certainly does — excellence like my HP Jornada Pocket PC!

Schwartz: Hardly! The collective, grassroots nature of Palm devotees will continue to make the Palm evolve and surpass Windows CE devices.

SIMPLE IS GOOD. . . .

Schwartz: The part reveals the whole, Russ. Take the screen. When Palm started, the designers must have said, "The screen is small, so we have to keep the interface clean and simple." And it is. Give me a task to add or a preference to change, and it takes me 10 seconds, tops. Each of the Palm's four main functions has a corresponding hardware button.

But Microsoft, with each successive version of Windows CE, says, "Let's take our great Windows interface and repackage it for handhelds!" Excuse me — reality check! The Windows interface has never been great, and in Windows CE it has run amok. Who knows what's where? The Pocket PC control panels are so overloaded that you can hardly find anything intuitively. It takes a lot of screwing around just to make basic adjustments or launch an application. And the voice recorder and MP3 playback software aren't integrated with the other applications.

Kay: Mat, you whippersnapper, your argument reminds me of the Mac vs. PC religious disputes. Face it: Both interfaces have problems, and the Palm is intuitive only because you're used to it. When I carried a Palm, I often couldn't remember how to get to something. You may hate the Windows interface, but I find it pretty useful, and in the current Pocket PC, Microsoft has interpreted it really well for the small screen. OK, the company needed three tries to get it right. So what? General Motors has spent seven decades trying to build a decent car.

. . . BUT CAPABILITY AND INTEGRATION ARE BETTER

Kay: The Pocket PC hardware and software are just plain better; they're more useful and usable than the Palm ever was. The 16MB of RAM, plus the add-in compact flash (CF) slot, lets me carry a lot of information. It's a great travel companion.

For a recent trip, I downloaded a detailed map into Microsoft's Pocket Streets, complete with restaurant and hotel information and pointers to where I was going. The Media Player software let me listen to tunes via headphones.

And the electronic-book software — Microsoft Reader with its ClearType font rendering — made it easy and pleasant to read a book on-screen during a long evening bus ride.

Schwartz: ClearType makes for nice reading, but it's Microsoft all over again: So far, it only works with the electronic books it creates. How useless. Is the company scared someone will steal the application if it's built into its insecure operating system?

Kay: Sure, ClearType belongs in the operating system, but this is its first release. And I think it will be in the operating system before long. Oh yes, Reader works with any electronic book created to the new standards.

WHO NEEDS WHAT?

Schwartz: I've tried the new color Palm, the $450 IIIc. It's a lot easier to read than the Palm III that I love. But you know what? I don't need it.

Kay: Well, I *do* need it. I can't tell you the number of times I've strained to read the Palm in middling light. Its backlight is useless except in total darkness. Mat, wait 20 years until you're wearing bifocals, then see how useful the Palm is. I don't need color, but I do need a decent screen image. And no monochrome handheld — Palm or Windows CE — has it.

Schwartz: Addresses, checklists and phone numbers — that's me. I look at my Palm for bursts of 10 or 20 seconds. Same for local movie listings, which I capture using the free program AvantGo. Same for recent e-mail. I'm not reading the latest Stephen King novel on my Palm; I've got enough computer-related eyestrain, thank you. To edit a document, I print it out. To type in text, I use the add-on keyboard.

POWER WHEN YOU NEED IT

Kay: I wouldn't use either a Pocket PC or a Palm for capturing or editing text if I had any other choice. But the Pocket PC's power and convenience can, on occasion, be really helpful.

Schwartz: By that logic, Russ, I should spend lots of extra money to make sure my new TV is HDTV-ready. Palm gives you options, but Microsoft has abandoned the less-expensive end of the market and cares only about corporate users. I guess it gave up on individuals.

Kay: Yes, Microsoft has opted to focus on the high-end personal digital assistant. That's a marketing decision. In fact, it's a good example of not trying to be all things to all people.

Schwartz: But their worldview is all wrong! Need to edit a document? Use a laptop or just print it out.

Kay: Try to fit a laptop or a printout into your shirt pocket!

Schwartz: Well, if you need an address or movie time, you can use a Palm. For $250, I get 8MB of memory, plus the 2MB that stores the core applications. That's plenty of power for me to do a lot of different things.

Kay: Yeah, and for $100 I can get any number of dedicated organizers that will store just as much and work as simply.

Schwartz: Hardly! You're selling the Palm short. If you want audio, buy a Palm and an MP3 player. You'd save money to boot.

Kay: It all depends on what you're willing to give up. To me, the Pocket PC's strength isn't in being a better organizer; if that's all you want, you don't even need a Palm. But the Pocket PC will spark some good handheld mobile applications. You stick to your Palm organizer, Mat. As for me, I want to do more, and with the Pocket PC, I can. ◗

AT A GLANCE

Palm IIIxe

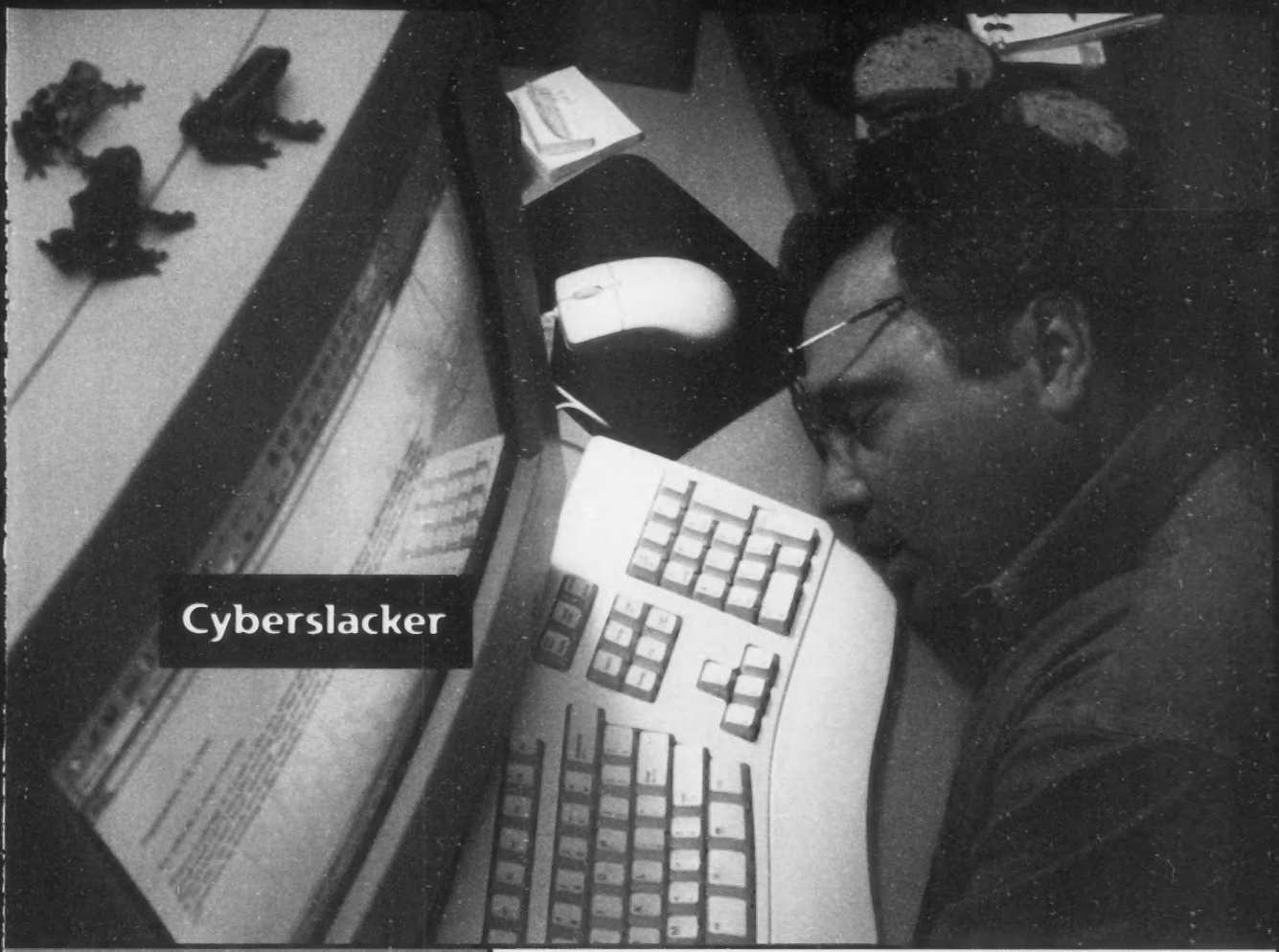
Palm Inc.
www.palm.com

- **Max internal memory:** 8 MB
- **Price:** $249
- **Operating System:** PalmOS 3.5
- **Display resolution:** 160 by 160
- **Display colors:** 16 gray-scale
- **Accessory add-ons:** Via Hotsync port
- **Batteries:** Two AAA batteries
- **Battery life:** Six weeks or more
- **Sound recording:** No
- **Music playback:** No
- **Video playback:** No
- **Word processing:** Third-party software
- **Spreadsheet:** Third-party software
- **Software included:** AvantGo, an expense program, e-mail and games; various software conduits allow the Palm to synchronize with other programs

Jornada 545

Hewlett-Packard Company
www.hp.com

- **Max internal memory:** 16 MB
- **Price:** $499
- **Operating System:** Windows CE 3.0
- **Display resolution:** 320 by 240
- **Display colors:** 4,000 to 65,000 colors
- **Accessory add-ons:** Via the CF slot
- **Batteries:** Built-in rechargeable battery
- **Battery life:** Eight hours or more
- **Sound recording:** Yes
- **Music playback:** Yes
- **Video playback:** Yes
- **Word processing:** Standard
- **Spreadsheet:** Standard
- **Software included:** Pocket Word, Pocket Excel, Internet Explorer, AvantGo, Pocket Streets, Pocket Outlook, Outlook 2000, Microsoft Reader, Microsoft Media Player, games, Transcribe handwriting recognition software and Microsoft Money



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Secret Shoppers Offer Personal Touch Online

Start-up BuyerTouch uses real live shoppers to evaluate e-commerce sites

BY AMY HELEN JOHNSON

SECRET SHOPPERS are commonly used by bricks-and-mortar retail businesses. People go into a store or restaurant to buy some items and make notes on such points as the store's appearance, the clerks' service, the merchandise displays or the bathrooms' cleanliness. Their opinions are bundled into a report that reveals how a potential customer would view the business, and it gives the management an idea of what works and what areas could use improvement.

Seattle-based BuyerTouch Inc. has adapted that idea for e-commerce stores, offering an assessment of a site from a visitor's perspective, including site usability, navigation and functionality. The idea is to find out what aspects of the shopping experience at a Web site attract and repel potential customers.

The secret-shopper touch is what differentiates the service from purely software-driven site-analysis tools, says BuyerTouch President and CEO Mike Bezona. While analysis software can tell you which pages were visited and for how long, his company offers customers insights into why people chose the actions they did. "We're not into the clickstream," he says. "We are the human aspect."

Delivering the Demographics

BuyerTouch is trying to solve a tough problem, says Steven Telleen, managing director of the Web Site Scorecard Service at high-tech consulting firm Giga Information Group Inc.

Telleen, in Santa Clara, Calif., says technical performance is fairly straightforward to measure, while customer acceptance isn't. What's going to make or break BuyerTouch, he says, is its ability to deliver testers who match the demographics sought by the Web site operators.

BuyerTouch has tens of thousands of shoppers, says Bezona. They all have to supply a demographic profile of themselves, he says, and they're screened through a third party that validates their profiles using existing databases of personal information. BuyerTouch gives them participation incentives in the form of cash or gift certificates.

The rest of the staff consists of analysts with backgrounds in market research who write summary reports on the shoppers' responses and make recommendations about site improvements.

At Seattle-based Shopnow.com Inc., Val Sanford, general manager at the online business portal's B2Bnow division, has been using BuyerTouch since January to give its customers independent feedback on the user interface experience. B2Bnow will build a high-end custom Web site, test its usability with BuyerTouch and then use the information to fine-tune the site.

Having the opportunity to select testers from a particular demographic segment sold Sanford on the service. Different target markets of online shoppers have different Web site requirements, she explains, and BuyerTouch understands that. "They're saying that there are different experiences for different goals," she says.

Choosing Targets

In addition to targeting site builders such as Shopnow.com as customers, BuyerTouch is looking to target large e-commerce sites, says Bezona. It also provides general reports that summarize aggregate data as a kind of best-practices curriculum for smaller organizations that can't afford an individualized test, he adds.

BuyerTouch's next move is to qualify its existing database of shoppers as corporate buyers and to find new shoppers who meet that profile, in order to build a service for business-to-business sites, according to Bezona.

The company is also working on a way to marry clickstream data with a shopper's reported experience. There's a strong desire to please among testers, explains Bezona, and the clickstream data will help pinpoint any discrepancies between the actions of shoppers and their reported experiences.

For now, says Telleen, this type of usability research and recommendation service is so new that it's a wide-open market. BuyerTouch has a grace period at the moment, he says, but it will soon face a shakeout. The company's survival will depend on whether it has correctly picked the kinds of testing services — brand preference, usability and competitive analysis — that site managers want, he says.

In addition, BuyerTouch faces the potential pitfall presented by the ever-changing nature of the Web. With sites changing frequently, it needs to compile reports speedily in order to provide value; if the analysis cycle stretches out, the interface and navigation presented to testers may be buried on last week's backup tapes. ◗

Johnson is a Computerworld *contributor in Seattle.*

JEFF HEINKING

BUYERTOUCH CEO MIKE BEZONA: "We're not into the clickstream. We are the human aspect"

BuyerTouch Inc.

Location: 725 North State St. Seattle, Wash. 98225

Telephone: (360) 733-6400

Web: *www.buyertouch.com*

The technology: Web site usability and functionality testing

Why it's worth watching: The "secret shopper" testing method elicits opinions and experiences of people with the site's target customer profile.

Company officers:
- Mike Bezona, president, CEO and founder
- Rusty Swayne, chief technology officer
- Philip N. Richins, vice president of research and development

Milestones:
March 1999: Company founded
Sept. 1999: First product introduced

Number of employees: 11; increasing at 50% per year

Profitability date: Anticipating profitability next year

Burn money: Private sources

Services: BrandTrac, LoyaltyTrac, Benchmark and Competitive Knowledge

Customer: Shopnow.com Inc.

Red flags for IT:
- Will the demographics of BuyerTouch shoppers match the profile of your ideal customer?
- Can BuyerTouch complete its research before a site changes enough to render a report obsolete?
- Will it survive the inevitable shakeout in this emerging market?

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It's Qualitative, Not Quantitative

BuyerTouch CEO Mike Bezona emphasizes his company's qualitative research and focus on the user experience. This secret-shopper methodology is one type of market research; others include quantitative measurements of popularity such as customer surveys asking for ratings.

BizRate Inc.

Los Angeles
www.bizrate.com

This is a rating service for e-commerce sites. BizRate asks people who have made purchases on certain sites to fill out a survey rating facets of their experiences – ease of ordering and quality of the delivery service, for example. The company collects demographic information and statistical information about individual transactions. It also offers some qualitative information in the form of the text of shoppers' comments.

Media Metrix Inc.

New York
www.mediametrix.com

This company provides information about who's surfing what, when and for how long. By linking audience usage patterns with demographic data collected via its Q-Metrix service, Media Metrix can come close to giving a complete visitor profile. However, it doesn't offer directed, qualitative information like that provided by BuyerTouch.

PC Data Online Inc.

Reston, Va.
www.pcdataonline.com

Concerned mostly with site traffic, PC Data Online uses statistical sampling techniques among 120,000 participants to project measurements such as a site's unique visitors and total hours of viewing. The company also does custom surveys and is able to segment its database in a number of ways; for example, it can target groups based on their purchasing and travel habits.

Vividence Corp.

San Mateo, Calif.
www.vividence.com

Focusing on the user experience, Vividence is a close competitor of BuyerTouch. It uses the same business model of prequalified testers who are selected for particular projects, based on their demographic profiles. Testers have to use a custom browser that tracks their clickstreams as they perform a set of tasks.

– Amy Helen Johnson

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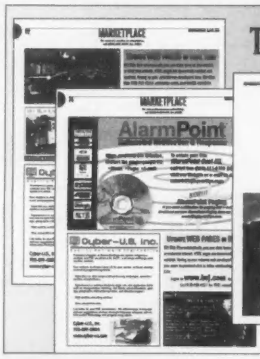

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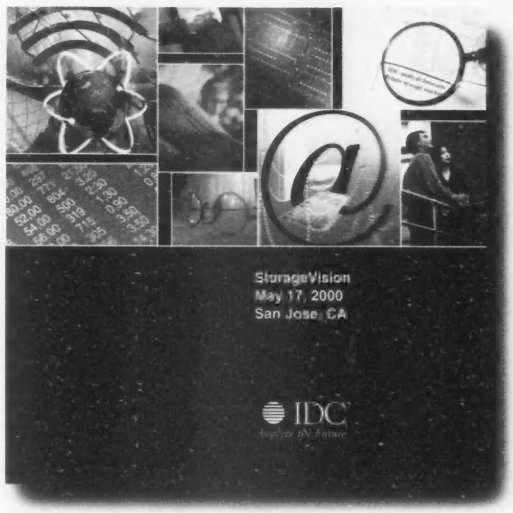

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Supply-Chain Management, Served Up Hot

BY MELANIE MENAGH

FROM ANCHOVIES and olives to boxes and ovens, Domino's Pizza Inc. has its work cut out for it, delivering pies from 4,500 stores serviced by 18 regional distribution centers nationwide.

Tim Monteith, CIO and supply-chain coordinator at Ann Arbor, Mich.-based Domino's Pizza, is overseeing a major overhaul in the company's information technology supply-chain strategy. The effort involves, among other things, replacing legacy systems with Pleasanton, Calif.-based PeopleSoft Inc.'s enterprise resource planning (ERP) system, customized to Domino's specifications.

So far, two of the 18 distribution centers have been wired, and the rest should be online by the beginning of next January. Monteith says he sees ERP, the catchall term for supply-chain issues, as a boon to his company and to any IT professional who has it in his skill set.

DOMINO'S CIO Tim Monteith says ERP projects have been a boon to the company and his career

DWIGHT CENDROWSKI

THE CHALLENGE

"Our first challenge is to coordinate movement in a closed world," says Monteith.

Although the Big Three automakers and large retailers such as Wal-Mart Stores Inc. have tended to be bellwethers among the ERP flock, the supplier-to-end-customer cycle is particularly crucial in the food service business.

"The majority of things we move are perishable," says Monteith. "They have a short shelf life, so we need to have these items visible and track them throughout the whole supply chain."

THE GOAL

Domino's goal is to achieve systems integration. Previously, inventory, accounts receivables, forecasting, marketing and supplier ordering were performed independently of each other.

"Now we're working on consolidation of information on a visual basis," says Monteith. "We want the supply chain totally integrated with our business and accounting divisions. We're automating things we used to be doing manually.

"The technology has really evolved over the last five years," he explains. "We're at the stage where we can affect our point-of-sale system, our distribution system, our supplier system, our data warehousing — pulling all these elements together."

The technology is still new, so there are potential glitches. "These are early products in the life cycle of the software," Monteith says, "so you're going to have some surprises, no matter who the vendor is."

Such surprises can be extremely sticky because the system affects stores and distribution centers across the country. "You're using software that's not mature," says Monteith. "And [the ERP software is] all over [the companywide enterprise], unlike HR or payroll applications that are basically contained in the home office, where you have a lot more control over the environment."

AVOIDING PROBLEMS

Monteith has tried to avoid potential problems by anticipating trouble spots. "You need to look at the new system and the way your organization does things and meet in the middle," he says.

"One of our biggest problems with integration was order entry, so we modified some of our procedures to accommodate the new system and, with consultants, made some modifications to the PeopleSoft package," he explains.

MANAGING CHANGE

Integration means that employees are communicating in ways they haven't communicated before. "A change of this magnitude is a real cultural shift for our user base," says Monteith.

"Training support is very important," he adds. "A lot of our customizing came from listening to customer service people, who told us things like, 'If I could press this button and do this, it would really speed things up for me.' "

ERP has been a boon to Monteith's career. Previously, he was CEO of a small software company that installed supply-chain models for book distribution companies.

"We did custom work in publishing, [and] then we sold them canned modules that did inventory control, warehousing [and] accounting," he says.

OUTLOOK FOR ERP

"It's a hot area," says Monteith. "We have trouble finding qualified people. When we do, they tend to get paid quite well. Especially if you've got a couple of years of Oracle and SAP under your belt and [have] worked on a product in the supply-chain arena, you'll go for a premium."

Menagh is a freelance writer in Maple Corner, Vt.

Name and title: Tim Monteith, CIO and supply-chain coordinator

Company: Domino's Pizza Inc., Ann Arbor, Mich.

Nature of the work: Finding solutions to company systems integration problems through ERP; developing an IT program that can adapt to fit into current corporate culture.

New skills involved: Integrating a customized PeopleSoft ERP supply-chain system throughout Domino's nationwide stores and distribution centers.

How he got the job: Monteith has a background in the development of customized and modular ERP systems.

Skills: Experience with Oracle Corp., Informix Corp. and SQL databases, as well as with database design, data warehousing and object-oriented programming; business knowledge in inventory control, accounting and marketing; strong communication skills to help get the user base and management on board with ERP developments.

Salary potential: There's typically a minimum 10% to 15% salary premium for IT professionals who have supply-chain experience.

Career path: Upper-level management

Career advice: Monteith suggests that those who are new to the field find a position that gets them in on the ground floor of a new installation. "That gives you the opportunity to see the business problems that are involved," he says. "You're not just maintaining code but learning about the way the supply chain works, from the ground up." – *Melanie Menagh*

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Electrical Engineer: Using Electronic CAD; Mentor graphics' DA-LMS, BoardStation, Layout and Librarian design electronic engine/powertrain control modules which involve application of advanced embedded microcontroller and power driver circuits using high power MOSFETs/IGBTS, for the next generation direct injection gasoline engines exhibiting super performance, high reliability, low fuel consumption and emissions. Responsible for various aspects in different product development phases including product definition, logic design, schematic entry, hardware verification, design development and simulation(using Electronic circuit simulation, SPICE, Saber, MAST) of analog and mixed signal circuits to meet specific automotive system requirements. Provide support to PCB layout, prototype build, in-circut and functional testing, as well as, software debug etc. 2yrs. of exp. in job offered or 2 yrs. of exp. as a Computer Design Engineer. 40 hrs. per wk., 7:30-4:30p, $52,800 salary. Send resumes with Soc. Sec. number to the Indiana Department of Work force Development, 10N. Senate Ave. Indpls. In. 46204-2277. Atten: DPG include I.D. #8075219 when responding

Systems Engineer to design, develop, test and install Network Test Access Systems (NTAS) solutions utilizing copper and fiber optic matrix switches and SNMP based PathMaster control software on UNIX and Windows NT systems; Provide engineering design and support of NTAS for ATM, fram-relay, FDDI, DS1, DS3, SONET, token ring, Ethernet, and DSL networks; Train customers; Create systems engineering web site and administer site using HTML, Javascript, Perl CGI, and JAVA under Linux operating systems; Use knowledge of Java to develop code for PathMaster software to enhance with RMON monitoring capabilities. Require: B.S. degree in Computer Science, Electrical Engineering, or a closely related field, with four years of experience in the job offered or as a Network Engineer; Extensive travel on assignment to various client sites within the U.S. is required. Salary: $80,000 per year, 9 am to 6 pm, M-F. Send resume to: Vincent J. Dugan, CEO, NET-Hopper Systems, Inc., 330 Research Court, Suite 250, Norcross, GA 30092. Attn: Job RO

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Web Analyst: Designs and develops internet, intranet, and extranet systems in connection with the company's e-commerce initiatives. Analyzes and applies advanced technologies in the systems design, development, and implementation phases relative to internet, extranet, and intranet systems. Assists users and other team members in the design and development of technical specifications used to develop system programs according to user requirements. Designs, develops and codes system programs for the company's internet, extranet, and intranet. Researches and analyzes existing and new web-based technologies in the industry. Develops Web Graphical User Interfaces. Coordinates activities between manager, customer, and technical organization. Reviews and analyzes user operations and identifies areas of potential improvement. Documents technical requirements of new and/or improved systems. Establishes systems acceptance criteria for the user. Monitors systems operations and implements resolutions to technical problems associated with the operation and maintenance of e-commerce systems. Required is a Bachelor of Science degree in Computer Science, Management Information Systems (MIS), or Bachelor of Business Administration and one (1) year of experience in the position being offered or one (1) year of experience as a Programmer or Web Developer. As part of the required experience in the position being offered or in the related occupation, the applicant must have had experience in analyzing, developing and implementing web-based applications; had experience in developing e-commerce sites using HTML, Java Script, C++, and BroadVision application software; and had experience with relational or object-oriented database management, including Oracle and DB2. Monday through Friday; 8:00 AM to 5:00 PM; 40 hours per week; $43,000 to $50,000 annually. Qualified applicants can submit two (2) copies of resume and cover letter to Mike Brooks File #C101387; DWE-ALC; PO Box 7972; Madison, Wisconsin 53707-7972. Reference File #C101387.

Software Engineer Positions to design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have 1 year of skills in field. Bachelors degree, or foreign equivalent, in Computer Sci/Apps, Eng., Chem., Math, Physics or a scientific or business related field. Salary: $66,000 per/yr. 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Jaime Lopez, Rapidigm, 4400 Campbells Run Road, Pittsburgh, PA 15205.

RDBMS: DB2, Informix, Oracle, FoxPro, MVS, Novell, UNIX, VAX/VMS, Windows, APT, Crystal Reports, C, C++, COBOL.

Oracle RDBMS: Designer 2000, Developer 2000, Oracle RDBMS, Oracle Applications, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL*Reports.

GUI and Internet Applications: Windows 95, Windows NT, Visual C, Visual C++, C, C++, Visual Basic, PowerBuilder, TCP/IP, HTML, MFC, CGI, MTS.

Mainframe: IBM3090, IBM ES900, MVS, IMS, CL/400, CICS, TSO, VSAM, COBOL, JCL, AS/400.

Software Engineer Positions to design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have 1 year of skills in field. Bachelors degree, or foreign equivalent, in Computer Sci/Apps, Eng., Chem., Math, Physics or a scientific or business related field. Salary: $70,000 per/yr. 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Jaime Lopez, Rapidigm, 4400 Campbells Run Road, Pittsburgh, PA 15205.

RDBMS: DB2, Informix, Oracle, FoxPro, MVS, Novell, UNIX, VAX/VMS, Windows, APT, Crystal Reports, C, C++, COBOL.

Oracle RDBMS: Designer 2000, Developer 2000, Oracle RDBMS, Oracle Applications, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL*Reports.

GUI and Internet Applications: Windows 95, Windows NT, Visual C, Visual C++, C, C++, Visual Basic, PowerBuilder, TCP/IP, HTML, MFC, CGI, MTS.

Mainframe: IBM3090, IBM ES900, MVS, IMS, CL/400, CICS, TSO, VSAM, COBOL, JCL, AS/400.

Manager of Computer Operations: Directs and coordinates activities of workers engaged in computer operations. Adjusts hours of work, priorities, and staff assignments to ensure efficient operation, based on workload. Plans and develops policies and procedures for carrying out computer operations. Meets with subordinates to discuss progress of work, resolve problems, and ensure that standards for quality and quantity of work are met. Knowledge of software consultancy industry required. Consults with software and hardware vendors and other establishment workers to solve problems integrating computer processing. Experience with team management, client management and budget management. Work involves extensive travel and frequent relocation. Must have one year of experience as a computer professional and one year of experience using: 1 of Group A and 1 of Group B and 1 of Group C; OR 1 of A and 2 of B; OR 1 of A and 2 of C as follows: Group A - Windows 3.1, Windows NT, Windows 95, Windows 98, Unix, HP-UX, IRIX, Sun OS; Group B - Visual C++, Visual C, C, C++, Visual Basic, PowerBuilder; Group C - JAVA, TCP/IP, HTML, MFC, CGI, PERL, ASP, COM/DCOM, Active X, MTS. Master's degree or foreign equivalent in one of several limited fields. Computer Sci/Apps, Eng., Chem., Math or Physics. Will accept Bachelors degree with five years of progressive experience as computer professional. Salary is $100,000 per/yr plus bonuses, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Ms. Mary Pat Curran, Supervisor, McKeesport/Allegheny County Careerlink, 345 Fifth Avenue, McKeesport, PA 15132-2600, Job Order No.: WEB 88362.

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Senior Software Engineer
Design and develop CORBA Object Request Broker Product to solve the interoperability problem of COM, CORBA, RPC based applications. Generate the client and server code. Work with CORBA architecture and design. Wholly responsible for project including supervision. Demonstrated ability designing and developing Informix DBA. Demonstrated ability designing and developing client/server applications using C++ and VB. $75,000/yr. 40 hr/wk. 9 a.m - 5 p.m. Must have 5 yrs. exp. (or 5 yrs. Exp in related occupation of Software Engineer/Computer Programmer/Analyst) and B.S. Comp. Sci., Math, Eng. rel. field/equiv. Send 2 copies of resume: Job Order #2000-190, P.O. Box 989, Concord, NH03302-0989.

PROGRAMMER/ANALYST to analyze, design, develop, test, implement and maintain client/server-based application software for telecommunication industry clients using C, C++, HTML, Shell, Xdb, Workshop, CMVC, Purify, Informix and TCP/IP under the UNIX platform in a LAN environment. Require: M.S. degree in Computer Science, Electrical Engineering or a closely related field; Must have a demonstrate ability to perform the stated job duties gained through academic course work/previous work experience; Extensive travel to various client sites within the U.S. is required. Salary: $64,000 per year, 8 am to 5 pm, M-F. Appy in person or by resume to: Georgia Department of Labor, Job Order # GA 6495496, 1535 Atkinson Road, Lawrenceville, GA 30043-5601, or the nearest Department of Labor Field Service Office.

Senior Software Engineer Positions to design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience in job offered or as a computer professional as well as 1 year of skills in one of the following fields: SAP, Baan or PeopleSoft. Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or scientific or business related field. Will accept Bachelors degree with five years of progressive experience as computer professional. Salary: $105,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Jaime Lopez, Rapidigm, 4400 Campbells Run Road, Pittsburgh, PA 15205.

Analyze, design and develop commercial software applications for 16 - bit and 32 - bits Windows enviroments. Design and code Microsoft Windows based GUIs and application code using tools such as VC++, VB, MFC Access and SDK. Design and implement backend database support using database such as MS Access and SQL server. Demonstrated ability in advanced windows development using custom controls, graphics, printing and multi-threading. Demonstrated ability of design and development of OLE servers and containers. $63,000/yr. 40 hr/wk. 9.a.m - 5p.m. Must have 2yrs. exp. and B.S.in Comp Sci, Eng rel field/equiv. Send 2 resumes: Case#19991133, P.O. Box 8968, Boston, MA 02114.

Analyze, design and develop commercial Software applications for 16-bit and 32-bits Windows enviroment. Design and code Microsoft Windows based GUIs and application code using tools such as VC++, VB, MFC and SDK. Design and implement backend database support using databases such as MS Access, SQL server. Demonstrated ability in advanced windows development using custom controls, graphics, printing and multi-threading. Demonstrated ability of design and development of OLE servers and containers. $53,000/yr. 40 hr/wk. 9.a.m - 5p.m. Must have B.S. with 2 yrs experience .Send 2 resumes: Case#19991297, P.O. Box 8968, Boston, MA 02114.

Software Engineer Positions to design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have 1 year of skills in one of the following fields: SAP, Baan or PeopleSoft. Bachelors degree, or foreign equivalent, in Computer Sci/Apps, Eng., Chem., Math, Physics or a scientific or business related field. Salary: $80,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Jaime Lopez, Rapidigm, 4400 Campbells Run Road, Pittsburgh, PA 15205.

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Analyze, design & develop client-server & web-based applications for telecommunications network maintenance using VB, SQL Server, C++ & ActiveX. Develop & implement methodologies to reverse engineer legacy systems. Develop communication software & web-based client/server GUI/database applications & ActiveX components to support web-based applications. MS in Computer Sci., IT, or Engineering req. $60K/yr. 40 hr/wk. 2 resumes to: GA Dept. of Labor, Job Order # GA 6496077, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909, or nearest Dept. of Labor Field Serv. Office. AT&T is an Equal Opportunity Employer. We welcome and encourage diversity in the work place.

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Consultant. Design, develop, test and implement database systems applications for business clients using mainframe technology. Perform business analysis. Advise technical personnel on programming and analysis procedures. Tools: CICS; COBOL; DB2; Java; CASE Tools; Oracle. Master's degree in Computer Science* + 1 yr exp. in job offered or as a Systems Developer required. Prior experience must include: DB2; CICS; COBOL. (*Will accept a Master's degree in any engineering field). 40 hrs/wk. 9am-5pm. $69,000/yr. Must have proof of legal authority to work in the US. Send resumes to Nebraska Job Service, 550 South 16th Street, P.O. Box 94600, Lincoln, NE 68509. Ref#: NE 0265712/0048. An employer paid ad.

SOFTWARE ENGINEER.
Plans, develops, tests and documents computer programs, applying knowledge of programming techniques and computer systems for acrospace and scientific applications. Master of Science in computer science or electrical engineering and six months' experience in job offered required. Must be able and willing to travel. One year's experience required using (1) ERDAS IMAGINE Developer Toolkit and ERDAS IMAGINE Software; (2) C, C++; (3) UNIX/Windows. $50,000. Qualified applicants send resumes to William R. Pennington, Director of Operations, ERDAS, Inc., 2801 Buford Highway, Suite 300, Atlanta, GA 30329.

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Software Engineer Positions to design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have 1 year of skills in one of the following fields: SAP, Baan or PeopleSoft. Bachelors degree, or foreign equivalent, in Computer Sci/Apps, Eng., Chem., Math, Physics or a scientific or business related field. Salary: $85,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Jaime Lopez, Rapidigm, 4400 Campbells Run Road, Pittsburgh, PA 15205.

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Oracle, Developer/2000, PL/SQL and C. Requirements: Master's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of Oracle, Developer/2000, PL/SQL and C. Salary: $66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Mary Pat Curran, Mckeesport/Allegheny County Careerlink, 345 Fifth Ave, Mckeesport, PA 15132-2600. Job No. WEB88350.

Software Engineer
Design, develop and implement software applications on multiple platforms using tools such as Perl, Sybase, C, C++, Java, JavaScript, HTML, CGI. Knowledge working with languages such as C, C++, Java. Demonstrated ability working with web scripting programs such as Perl, Sybase. $65,000/yr. 40 hr/wk. 9 a.m - 5 p.m. Must have 6 months exp. (or 6 ms. Exp. in related occupation of Programmer Analyst) and M.S. Comp. Sci., Eng. rel. field/equiv. Send 2 copies of resume: Job Order #2000-206, P.O. Box 989, Concord, NH 03302-0989.

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Senior Programmer/Analysts should possess a Bachelor's degree in Engineering or a related field; at least two years' experience in the field of computer information systems; and demonstrated knowledge of C++, JAVA, HTML, Visual Basic and MS SQL Server.
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Software Development Engineer. Duties: Resp. for integrating software & computer systems by analyzing global requirements & developing specs. using UML, object oriented analysis & design. Develop prototypes & applications which address business functions, workflow & software design using VisualBasic & Access. Develop & enhance software system or tools within n-tier client server environ. using VisualBasic. Develop & enhance software systems or tools by selecting, tailoring & implementing third party pkgs., tools or components. Support & troubleshoot for internal & external customers. Requires: B.S. in Comp. or Info. Sci., Eng. or a related field & 5 yrs. exp. in the job offered or 5 yrs. exp. as Prog./Analyst, Consultant or Project Leader. Will accept any comb. of educ. & exp. equiv to a bachelor's degree. Exp. which may have been obtained concurrently, must incl. 3 yrs. exp. developing & enhancing software systems & 3 yrs. exp. using VisualBasic & Access. EOE. 40 hrs/wk., 8:00 a.m. to 5:00 p.m. Salary: $65,000/yr. Send resume (no calls) to: Teresa Davidson, Volvo Commercial Finance LLC The Americas, 7823 Nat'l. Service Rd., Bldg.2, Greensboro, NC 27409.

Software Engineer to design, develop, implement, and maintain server-side software and systems in an n-tiered client/server environment using C, C++, Pro*C, and Oracle under UNIX operating systems; Perform object-oriented programming and design using C++, Rogue wave, Rational Rose and methodologies such as Booch and OMT under UNIX operating systems; Implement distributed object-oriented systems using CORBA; Use SQL and PL/SQL to do database development for RDBMS such as Oracle; Develop scripts using Perl and Shell Scripts. Require: M.S. degree in Computer Science, an Engineering discipline, or a closely related field; Must have a demonstrated ability to perform the stated duties gained through previous work experience/academic coursework and projects. Extensive travel required on assignment to various company and client sites within the U.S. Salary: $70,000 per year. 8:00 am to 5:00 pm M-F. Send resume to: Ravi S. Kandhal, Director of Consulting Services, Axiom Systems, Inc., 2550 Northwinds Parkway, Alpharetta, GA 30004; Attn: Job JS.

Software Engineers: Conduct research & develop, test & maintain programs, which comprise a portion of a system product or future products. Exp &/or background in the following areas (not all req): relational database systems, database management systems, distributed management and recover techniques, TCP/IP,Socet IP, C, C++, SQL, AIX, UNIX, JAVA, object-oriented programming languages, Lotus Notes, Windows (95,98,NT) operating systems, 80x86 assembly language, Softice debugger and device drivers for Windows, data security, Internet/Intranet WEB applications, http, CGI, graphical user interfaces, object-oriented analysis and design techniques, domain modeling techniques, version management, configuration management, multimedia standards (MPEG-4, H.2xx, H.3xx, G.7xx, RTP/RTSP). Req: MS in CS/Math/ME/EE/Comp Eng + 1, 2, or 3 yrs exp (or equivalent) depend on position or BS + 3-5 yrs exp depend on position in Austin, TX, San Jose, CA Hawthorne or Yorktown Heights, NY. Endicott, NY.Competitive salary. Please send resume w/clipping of ad to: IBM Corporation, Technical Recruiting, Job Code CW04A00, P.O.Box 218, Youktown Heights. NY 10598. An equal opportunity employer.

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Sr. Consultant (Software Development)
sought to consult w/clients to define need or problem & develop customized software solutions. Analyze client business requirement. Perform maintenance & enhancement of software using JCL, COBOL, & SAS in an IBM mainframe environment. Perform appropriate unit & system testing. Assist in development of functional specifications; develop technical specifications as necessary. Answer questions & resolve problems. Resolve production problems as & when they occur on a high-priority basis. Provide on-call coverage as scheduled. Provide support to junior members of the team. Applicants must have Master's or equiv. in Computer Science, Math or Statistics + 6 mos./exp. in job offered or 6 mos./exp. in the use of SAS. Education or experience must include SAS. Will accept Bachelor's + 5 years of progressively responsible experience in lieu of a Master's degree & six months of experience Applicants must be willing to travel to various client sites throughout the U.S. & commute within 60-mile radius of home. Salary: $58,000/yr. Hrs: 40/wk. Please send 2 copies of resume to: Case #19983622, PO Box 8968, Boston MA 02114.

SENIOR SOFTWARE ENGINEER to lead a cross-functional and cross-product team in the design, development, testing and maintenance of client/server based application software and Graphical User Interfaces for manufacturing industry clients using UML, object-oriented programming, C++, Java, Oracle, DB2, COM, CORBA, Lex and Yacc under Windows NT, UNIX, HP-UX and SunOS environments; Evaluate work assigned, Estimate time and manpower requirements; Delegate and coordinate workflow; Maintain project scheduling and ensure project is completed on-time and on-budget; Provide status reports and conduct performance reviews. Require: M.S. degree (or equivalent) in Computer Science/Engineering with a demonstrated ability to perform stated duties gained through previous work experience / academic coursework and projects. AB.S. degree with and additional five years of progressively responsible experience in the field will be considered equivalent to the M.S. degree. Extensive travel on assignment or various client sites within the U.S. is required. Salary: $75,000/year; 8am to 5 pm M-F. Send resume to : Ravi Ramaswamy. Vice President, Marketing and Business Development, Beechwood Computing Ltd., 41 Vreeland Avenue, Totowa, NJ 07512; Attn: Job GK.

Senior Software Engineer Positions to design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have one year of experience in job offered or as a computer professional as well as 1 year of skills in field. Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or scientific or business related field. Will accept Bachelors degree with five years of progressive experience as computer professional. Salary: $80,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m., Please submit resumes to: Jaime Lopez, Rapidigm, 4400 Campbells Run Road, Pittsburgh, PA 15205.

RDBMS: DB2, Informix, Oracle, FoxPro, MVS, Novell, UNIX, VAX/VMS, Windows, APT, Crystal Reports, C, C++, COBOL.

Oracle RDBMS: Designer 2000, Developer 2000, Oracle RDBMS, Oracle Applications, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL*Reports.

GUI and Internet Applications: Windows 95, Windows NT, Visual C, Visual C++, C, C++, Visual Basic, PowerBuilder, TCP/IP, HTML, MFC, CGI, MTS.

Mainframe: IBM3090, IBM ES900, MVS, IMS, CL/400, CICS, TSO, VSAM, COBOL, JCL, AS/400.

Senior Software Engineer Positions to design, develop and implement software systems to determine feasibility of design and directs software testing procedures, programming and documentation. Work involves extensive travel and frequent relocation. Must have 1 year of skills in field. Master's degree in one of several limited fields: Computer Sci/Apps, Eng., Chem., Math or Physics or scientific or business related field. Will accept Bachelors degree with five yeurs of progressive experience as computer professional. Salary: $75,000 per/yr, 40 hrs/wk., 9:00-5:00 p.m. Please submit resumes to: Jaime Lopez, Rapidigm, 4400 Campbells Run Road, Pittsburgh, PA 15205.

RDBMS: DB2, Informix, Oracle, FoxPro, MVS, Novell, UNIX, VAX/VMS, Windows, APT, Crystal Reports, C, C++, COBOL.

Oracle RDBMS: Designer 2000, Developer 2000, Oracle RDBMS, Oracle Applications, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL*Reports.

GUI and Internet Applications: Windows 95, Windows NT, Visual C, Visual C++, C, C++, Visual Basic, PowerBuilder, TCP/IP, HTML, MFC, CGI, MTS.

Mainframe: IBM3090, IBM ES900, MVS, IMS, CL/400, CICS, TSO, VSAM, COBOL, JCL, AS/400.

SOFTWARE ENGINEER (Westwood, MA). Design, develop, analyze, test, debug & document software products, product features & product enhancements utilizing C/C++, MFC under UNIX and Windows NT environments. Detect deficiencies in software applications & add new functionalities & features utilizing TCP/IP protocols. Install tested products & provide product expertise in the resolution of complex technical problems & validate product functionality. Detect & determine the origin of problems in code on different platforms to make enhancements & place them in the appropriate section of the code to achieve maximum performance based upon clients needs. Req's: Bachelor's in Comp Sci, Math or Eng, & 2 yrs exp in job offered or 2 yrs exp as Programmer or Research Assistant. The 2 yrs exp must include working with C/C++, MFC, Windows NT, UNIX and TCP/IP 40 hrs/wk, 9:00am-5:00pm, M-F; $82,000/yr. Send resume to Case #: 19991029, PO Box 8968, Boston, MA 02114.

Technical Consultant. Job location: Conshohocken, PA. Duties: Analyze & implement e-commerce solutions for clients by the design & develop. of internet, intranet & extranet solutions incl. e-mail messaging systems, elec. banking, messaging architectures as well as web enabled data warehouses, web-based client interface & internet & extranet security using Java (JDK, Servlets, EJB, Java Server Pages (JSP) & JavaScript), HTML, Netscape Application Server (NAS) & Netscape Enterprise Server (NES). Design & develop database solutions & develop distributed applications. Requires: 4 yrs. exp. in the job offered or 4 yrs. exp. as a Consultant, Analyst, Software Eng. or Programmer. Exp., which may have been obtained concurrently, must incl.: 2 yrs. exp. designing databases using Oracle & Sybase, 2 yrs. exp. developing customizations of ERP systems & 2 yrs. developing application software manual & troubleshooting guide. EOE. 40 hrs./wk. 8:00 a.m. to 5:00 p.m. Salary: $67,000/yr. Send resume (no calls) to: Diane Tuccito, Answer-Think Consulting Group, 817 W. Peachtree St., Suite 800, Atlanta, GA 30308. Must have legal auth. to work in U.S.

Proficient Business Systems, Inc. is a fast growing IT services firm with Fortune 500 clients. We are currently looking for IT professionals to serve as programmer analysts and software engineers with experience in one or more of the following areas:

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- **System/Network Admin:** HP-UX, AIX, UNIX, Linux, Windows NT, Solaris, CISCO Routers, Novell Networks
- **Software Engineering:** TCP/IP, UNIX, Socket programming Entry and senior level consulting positions are available. A Bachelor's / Masters degree plus relevant professional experience may be required for most positions.

If you have expertise in any of these areas and you are ready for an exciting and fulfilling career then send your resumes by fax to **(847) 247 8471 or by email to resume@probys.com**

Hardware/Firmware Engineers: Conduct research and development of new technologies for computer and communications systems. Exp and/or background in the following areas (not all req): servo control theory and algorithm design, analog/digital circuit design and simulation, logic design and simulation using ALTERA programmable devices, Hardware Synthesis, magnetic recording head processing, electroplating, etching, photolithography, vacuum deposition, and magnetic material characterization FPGA/ASIC/Custom design and timing analysis, microprocessor based systems hardware and firmware design, MPEG-2 transport systems, digital signal processing, PC bus interface, board layout, instrumentation and C/C++ programming. Req: MS in EE/Comp Eng.+1, 2, or 3yrs exp (or equivalent)depend on position or BS +3-8 yrs exp depend on position in Austin, TX, San Jose, CA Hawthorne or Yorktown Heights, NY. Endicott, NY. Competitive salary. Please send resume w/clipping of ad to : IBM Corporation, Technical Recruiting, Job Code CW04B00, P.O.Box 218, Yorktown Heights, NY 10598. An equal opportunity empolyer.

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Caredata.com, a leading on-line syndicator of healthcare content & applications to a wide range of internet portals and e-commerce sites, is seeking an Information Systems Mgr. with background in GIS technology and geocoding, MapInfo, AutoCAD, Windows 95, and Windows NT, to provide leadership and development technology to the Geographic Info. Systems Dept. relating to healthcare organization in reducing administrative cost, improving delivery of care, physician credentialing and recruiting services, demographic info incidence of diseases, and other critical administrative and research data; evaluate, develop and purchase new hardware/software; support sales staff potable computers; systems maintenance, upgrade and network components; be responsible for data processing requirements, geocoding, installation of new systems, and planning network layout for 20-30 users. Candidates must have B.S. or equiv. in Computer Science or Computer Eng. and 2 yrs. relevant exp. or yrs. exp. in lieu of B.S. and 2 yrs. exp. Excellent salary and benefits pkg. Submit resume ref. Job #ISM-991, Attn: Corp. Recruiting Mgr., Two Piedmont Ctr., Suite 400, 3565 Piedmont Rd., Atlanta, GA. Fax (404) 364-6719. E-mail (404) 364-6719. Must reference Job #ISM-991.

SYSTEMS ENGINEER II. Tobacco corporation requires the Systems Engineer to develop and support computer applications utilized by the Marketing Operations Department. The position also requires planning, organizing and executing system enhancement projects, including the determination of business requirements and effective system design approaches as well as the programming testing and implementation of the associated computer software. In addition, the position requires supporting and developing of Order Processing and related applications as well as providing technical support for user requests and directing the activities of a staff of support personnel. Qualified applicants must possess a Bachelor's Degree in Computer Science, Business Administration or other related discipline and must have three (3) years experience in the following software and hardware: ADABAS/NATURAL, CA-Easytrieve Plus, PL/1, MVS JCL and IBM S/390 along with six (6) months experience in both sales and Order Processing Applications. Hours:8-5. Salary:$57,000.00/yr. Only persons authorized to work permanently in the U.S. need apply. Please forward resume to Jane Hosley, Kentucky Department for Employment Services, 275 E Main St. 2-W, Frankfort, KY40621. Ref.#1293.
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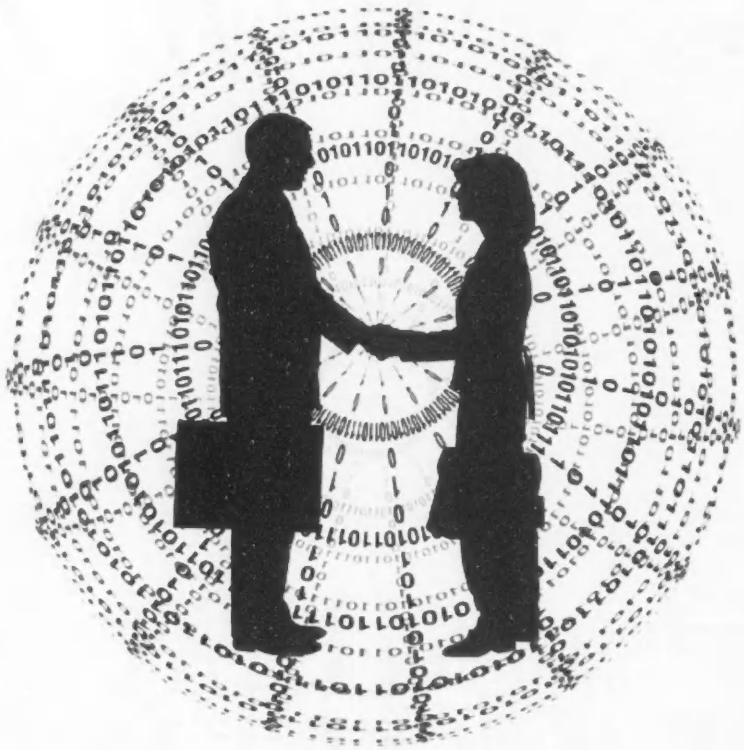

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Programmer/Analyst, Sacramento, CA-Provide tech.solutions,confer w/programmers, busin. analyst & project mngrs to achieve project goals; convert tech.instruction into programming code. Reqs.BS in MIS, Comp.Sci. or related field & 6 mos.exp.in devel.& programming of appls.using Micro Focus COBOL, Cold Fusion, Sun Solaris, NT Server, SQL, JAVA & Javascript. Send resume to Irene Reyes, 707 3rd St., W.Sacramento, CA 95605.

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Software Design Engineer (multiple openings)
Responsible for the design, implementation, and testing of software for microcomputers using principles and techniques of computer science, engineering, and mathematical analysis. Qualifications? BA/BS or MS in Computer Science, Engineering, Mathematics, Business or related discipline and experience in C/C++, Windows®, object-oriented design, multithreaded environment, relational database software, and/or networking, depending on the specific project.

All positions offer competitive salaries and excellent benefits. E-mail your resume in text format to: resume@microsoft.com (indicate Job Code A39t2-0320 in the subject header). Or mail your resume to Microsoft Corporation, Attn: A39t2-0320, One Microsoft Way, Redmond, WA 98052. No phone calls please. We are an equal opportunity employer and support workplace diversity. Visit our Web site for more details.

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Senior Programmer/Analyst sought by company in Denver, CO specializing in business software solutions to work in Denver & other unanticipated job sites in the US. At a senior level, design & develop software applications &/or software tools that incorporate client/server architecture, interface with a variety of relational database management systems, & are platform independent. Analyze requirements. Create designs & design documentation. Code, test, & de-bug the software applications. Use proprietary CASE tools, & C/C++ programming languages in the design & development process. Provide technical assistance to Programmer/Analysts. Requires Master's in computer science or related field (including MIS); Working knowledge of designing & developing software applications, client/server architecture, relational database management systems, & C/C++. (Working knowledge may be gained through employment or in an academic setting.) 8am-5pm, M-F; $60,000/yr. (2 openings.) Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order #CO4654762.

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IT Developer III,Sacramento, CA Responsible for coding, testing, implementing & documenting automated business solutions. Assists w/design of tech.solutions,creates detailed tech. design documentation & collaborates w/technical areas to integrate across tiers, platforms & comparable resp. Works directly w/the FFELP student lending industry.Participates w/project teams in the construction competency to use, identify,define and continuously improve best practices. Reqs.BS in Computer Science & 4 yrs.of exp.must have included work w/Progress dvlp.1.5 yrs of the reqd.exp.must have included work w/Progress AppServer, Progress WebSpeed, UNIX shell scripting, & Actuate Report dvlp. and developing financial software. Send resume to Irene Reyes, 707 3rd Street, Sacramento, CA 95605.

Programmer/Analyst sought by company in Farmington Hills, MI specializing in developing software/providing professional services to work in Englewood, CO. Design, develop & test computer software applications that run on Windows platform & access relational database management systems. Engage in analysis of user requirements to develop software design. Code, test, & de-bug the software applications. Provide installation & user support . Use C/C++ programming languages & SQL in the development process. Requires: Bachelor's or foreign equivalent in comp. sci. or related field; 1 year experience performing the duties & using the technologies described above. 8am-5pm, M-F; $59,600/yr. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order #CO4654617.

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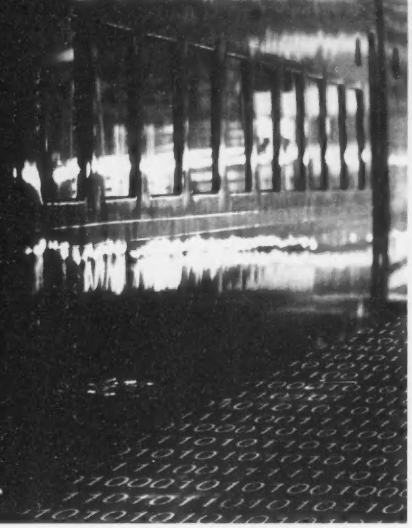

■ PROJECT MANAGERS
- Ability to manage multiple team projects & lead development of Web-based, client/server & internet/intranet application development. Strong background in implementation of consultation projects. Must have a bachelor's degree in computer science or related field; 5+ years PM experience. Excellent people skills & client relations a must. Coding & prior web-experience a plus.

■ SOFTWARE DEVELOPERS
- 4+ years experience in design & delivery of Web, client/server, Java/Java Script, VB, C/C++, ASP, COM, Oracle, Sybase, SQL Server & HTML. Must have a minimum of a BS in computer science or any relevant field. Experience in preparing work & test plans, communicating project deliverables, gathering requirements & delivering program specifications. Excellent communications skills a must.

■ INTERNET ARCHITECT
- Must have 5+ years in IT. Experience with full life cycle, multi-tier application design & development & gathering of technical requirements. Strong understanding of data, application & infrastructure design. Ability to define & deploy data models. Proficiency in designing & supervising security architecture deployment. Middleware experience preferred. Excellent communications skills & client interaction a must.

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Sr. Software Engineers for E-Business Applications: Technomation Systems Inc. which serves the energy, technical, engineering, and financial-services industries, is looking for Sr. Software Engineers with 3+ yrs experience in Microsoft COM/DNA, ASP, XML, and SQL Server. The position involves research, analysis, design, and development of Internet programs for Web-based knowledge management, customer relationship management, sales force automation, and e-commerce. Requires Masters degree in computer science or in any related discipline. Please email/fax/mail your resume to Technomation Systems Inc, 580 Westlake Park Blvd, Suite 710, Houston, TX 77079. Fax 281/596-9380. Careers@technomation.com

Software Engr. Research and develop software systems that enable high performance, reliable network systems to be used in complex business applications. Analyze software rqmts to determine feasibility of design; evaluate soft/hardware interface. Perform network monitoring and remote control of workstations. Design and implement LAN/WAN and real-time model for MS Distributed Internet Architecture. Develop software testing procedures and documentations. Tools used are HTML, SQL, COBOL, on UNIX and NT Server. Requires Masters in BA or Comp. Science and 1 years exp in position or as Prog Analyst developing bus application with above tools. Resumes: Blackwell Consulting Svcs. 100 S Wacker Ste 200, Chicago, IL 60607

Computer Systems Analyst

full time. Upkeep of Network to support Web Apps. Compaq and IBM AS400. Admin skills MS WinNT & Domino R5, IIS, Oracle Man/Fin(10.7), GUI/Tools Data Warehouse, PeopleSoft. Prog skills SYNON/2E, RPG/400, CL, SQR, PL/SQL Plus, C, C++, HTML & Java. Requires a Bachelor's Deg in Computer Science and 3 Years of exp in job offered. Send resume to HR Manager, c/o Mr. Gary Moeller at Hill-Rom, 1069 State Route 46 East, Dept. J96,Batesville, IN 47006.

Software Engr. Research, design, & develop software systems in conjunction with hardware development. Analyze rqmts to determine feasibility of design; evaluate interface between soft/hardware. Formulate & create mgmt systems for financial, banking, accounting, HR, & industrial usages. All systems utilize dBASE IV and Magic language. Must have 8 years direct exp or as Prog Analyst in financial field. 3 yrs must have used tools above. Resumes: Triple-I Corp. 3130 Finley Rd. Ste 510, Downers Grove, IL 60515

Software Engineer wanted by S/ware Dvlpt & Consultation Firm in Bellaire, TX. Must have M.S. in Comp Sci & 6 mos S/ware related exp. Please forward resume to: Technical Recruiter-CFW, Vision Systems LLC, 6750 West Loop South, Suite 690, Bellaire, TX 77401.

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- **Lotus Notes #120**
- **Oracle Database Support #217**
- **Oracle Database Server Product Engineer #311**
- **Intel Technology Product Engineer #310**
- **Technology Solutions Engineer #376**

IS Sr. Analysts
- **EDI Technology #318**
- **Financial Planning Systems #96**
- **Lotus Notes #358**
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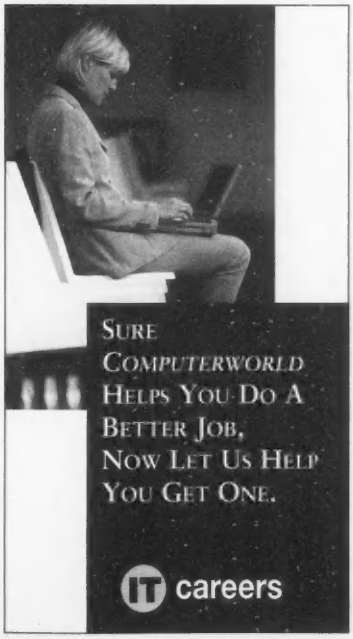

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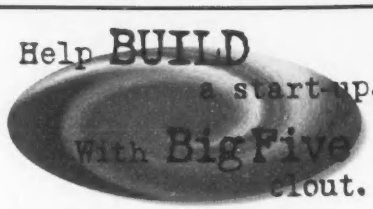

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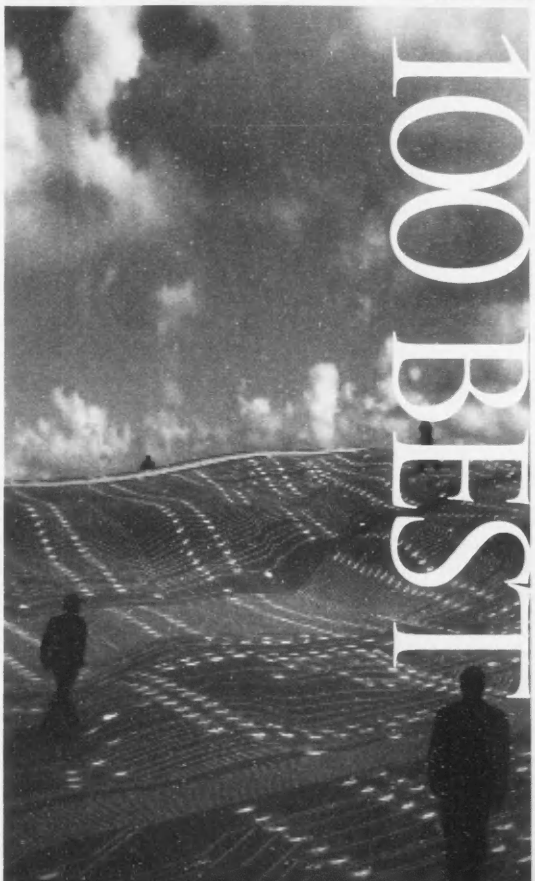

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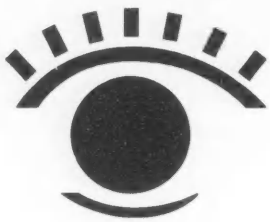

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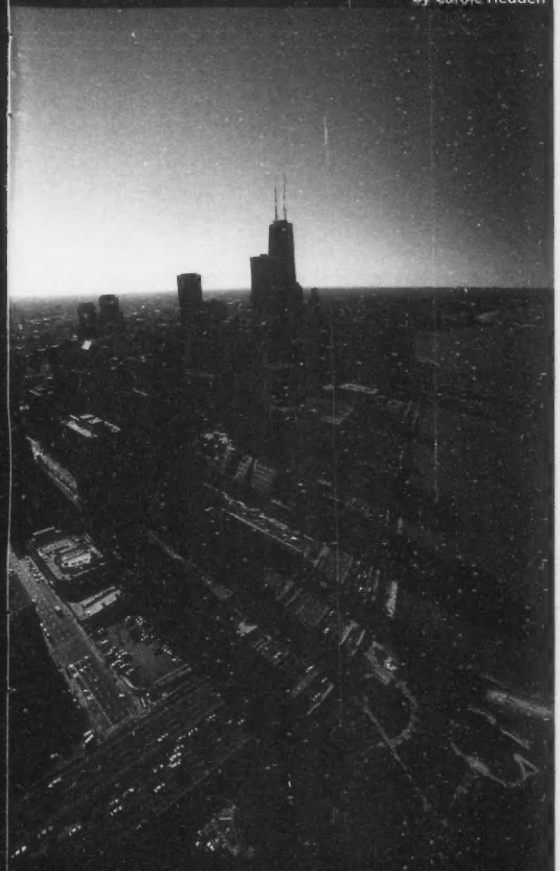
by Carole Hedden



The West Coast and the East Coast are not the only lands of IT innovation. In Illinois there are mega hitters in the IT game — companies with a long history and those who have created entirely new business models, companies large and small, known for their consulting prowess and production of new software and integration tools.

In fact, the third largest market for IT jobs in the United States is in Chicago along Interstate 88, what's known as the R&D Corridor in the Windy City. Unlike other IT power communities, the watchwords here include not only innovation and creativity, but also words like loyalty and enduring business.

Advertising Supplement

In Illinois there are mega hitters in the IT game

Sentinel Technologies, Inc.

Downers Grove, IL

Nestled down between the Lucent Technologies and Arthur Andersen's found in Chicago, Sentinel Technologies is a technology firm that's been around for nearly 20 years. From its beginnings as an IBM mainframe support firm, Sentinel has reinvented itself several times to adjust to shifting needs and technologies – to client/server and now to utilization of emerging technologies.

"Our new credo is we provide intelligent ideas and integrated solutions," says Brian Osborne, executive vice president of sales and marketing. With capabilities in designing emerging technology solutions and complete support for existing platforms, the company is positioned to do just that. Sentinel's two new practice areas, which address emerging technologies, are computer telephony integration (CTI) and e-business, two markets projected to experience tremendous growth. "As these technologies become more mainstream, they'll move into another portion of our business, which today includes design and deployment of technologies such as Microsoft and Cisco. Behind these two areas, we have a strong support business to assist our customers with hardware and software failures or application issues. We handle those 24-by-7."

Osborne says that one of the strengths of Sentinel, for employees and customers, is that there are a variety of skills and projects. "You can move between e-commerce, computer telephony integration, network security or field service," Osborne explains. "These areas offer varying levels of complexity so that you can grow. What has changed is what is viewed as entry level – a few years ago it was your ability to work with basic programs and some installation experience. Today, entry level is someone with enterprise level experience, a business consulting background, and people who can provide business solutions, not just technology."

Successful candidates tend to be those people who have at minimum mainstream technology experience, but just as importantly those who have demonstrated an ability to learn and to design and deploy technologies that are the correct answers for customers' businesses. Osborne says the company not only looks for people who can design but also present technological solutions.

"There are a lot of reasons to choose Sentinel as your place to work," says Osborne. "Our management team has been together, on average, 14 years. We've successfully navigated through the changes in this industry over the past two decades. We have a career plan that helps you stay on track and provides you with the ability to grow – and we reward that growth and pay you for what you bring to the business. In addition, our model of providing complete support services for emerging and existing platforms helps to insulate us from the peaks and valleys that so many technology-based companies experience. Also, emerging technology services gives us a way to develop core competencies early on, while feeding our other areas as they gain market acceptance. It's designed to be a sort of self-perpetuating, continuous cycle.

"One of the most important aspects of this company is that we are people who get gratification from doing excellent work and helping customers – that's no quick fix, rags to riches model. It's an enduring business model."

United Stationers

Des Plaines, IL

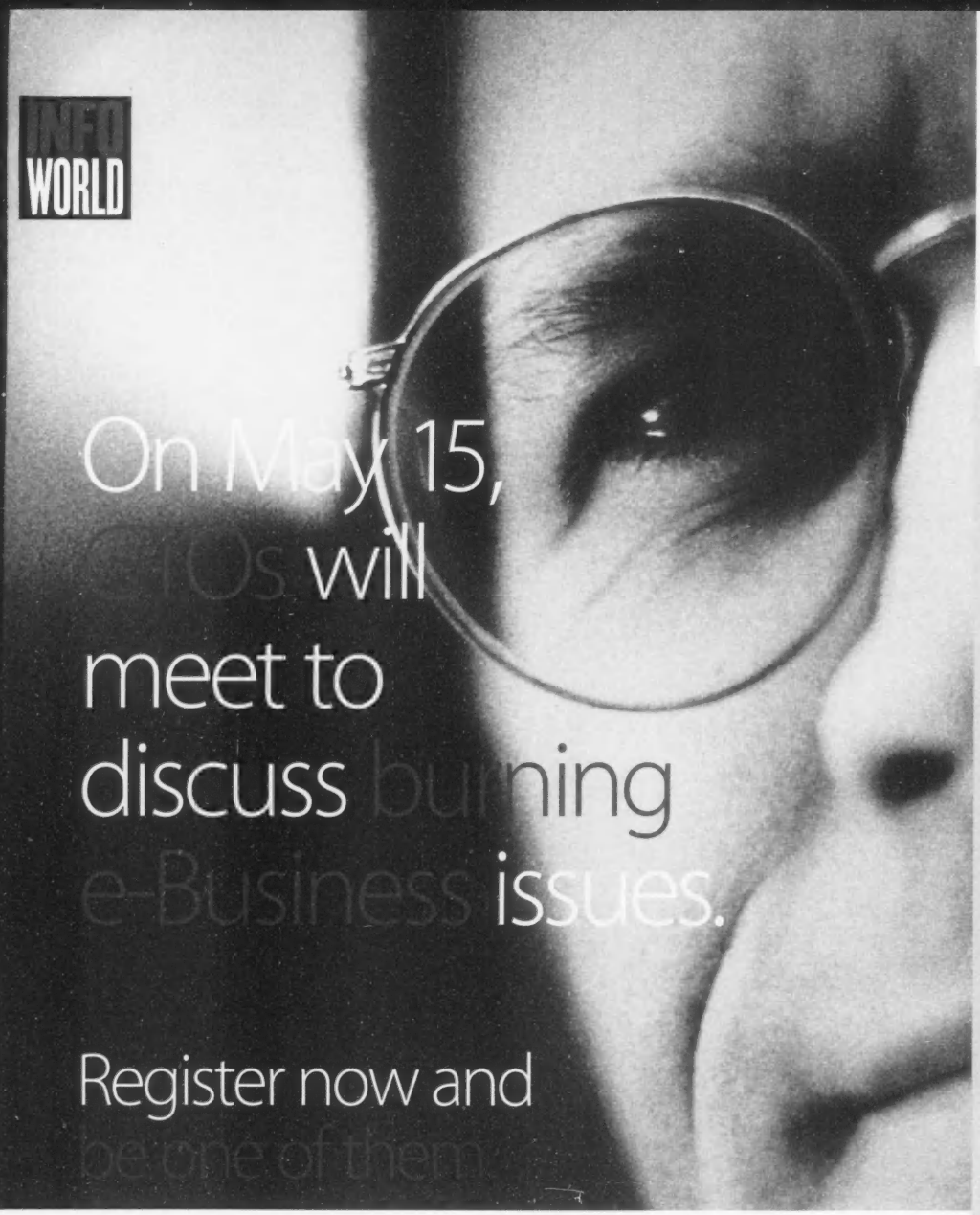
In the world of office supplies and equipment, United Stationers is among the leaders with $3.4 billion in sales in 1999. "Broadly, we provide office products, office furniture, computer supplies, office machines, and janitorial and sanitation products," explains Ergin Uskup, vice president of management information systems and CIO. "We distribute through a network of 66 warehouses, delivering most anything to our commercial customers within a 10-hour window."

This capability – to serve the office supply resellers that fall outside the realm of the major chains – is based on the evolving tool known as e-commerce. "In the sense of e-commerce, about 93 percent of our business has involved a transaction directly from a customer computer to ours," says Uskup. Over the past three years, this has begun to change with United Stationers developing an interactive Internet presence with the resellers who are the company's customers.

The company began about two and a half years ago to write shrink wrap software to enable their customers to do e-commerce. "Because a lot of our customers are small to medium-sized businesses, without IT staffs, we developed software to enable customers to be on the web, to use this capability," Uskup adds. "We host the system, which can be tailored by our customers, including how they charge taxes, their freight costs and the look and feel. Recently, we have partnered with another company, Internet Office Solutions & Services, who is in the process of offering enhanced versions of this software, as well as hosting services and support."

United Stationers has a multi-platform environment to support its distribution business. "We need people who can support and enhance the existing mainframe, client/server, Internet systems and build new ones on these platforms. It's important to be able to work in teams and to have some experience in distribution or supply chain management as well as the e-commerce environment. We're looking for project managers, business analysts, programmers and technical analysts (database, distributing computing, telecommunications and operating systems," Uskup says. "The most important skill, though, is the ability to learn and work in teams. We put a lot of emphasis on training and teamwork so these are key."

Uskup says the goal is for United Stationers to be the best place to work in the Chicago area. Already the company has won several laurels – ranking 53rd in *Information Week's* list of "500 Most Innovative IT Organizations" in 1999 and among the best in *Computerworld's "100 Best Places to Work in IT."* "We work very hard to make this place intellectually challenging, where you feel good about your work and have fun," says Uskup. "We pay attention to the details."



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Roller-Coaster Ride May Not Be Over

Stock plunge sets off alarm for tech investors

BY JAIKUMAR VIJAYAN

THE CONTINUING volatility of technology stocks suggests that there could be even more correction on the way before the market starts stabilizing again, analysts cautioned.

Both the Nasdaq composite index and the Dow Jones industrial average once again dropped sharply last Wednesday on future earnings concerns relating to IBM [NYSE:IBM] and Intel Corp. [Nasdaq:INTC]. Nasdaq dropped 84.24 points to close at 3,706.41, while the Dow shed 88.73 points to close at 10,674.96.

The losses broke a two-day winning streak during which both the Dow and Nasdaq seemed to be recovering strongly after the April 14 technology rout (see chart). That sell-off was triggered by inflation concerns that caused the Dow to lose more than 600 points and Nasdaq to lose more than 400 points — their largest one-day losses ever.

INDUSTRY ALMANAC

Last Wednesday's plunge shows the roller-coaster ride may not quite be over yet for technology investors, said Richard Chu, an analyst at Cowen & Co. in Boston. "What we are seeing is a deconstruction of the speculative excesses of the last few months."

As investors take a closer look at the stock valuations of some companies, "I would definitely not suggest that the correction process has finished. In fact, we are barely at the beginning," Chu said.

The April 14 sell-off suggests that "there is more downside to come — typically such a dramatic correction takes time to heal," said analyst Ashok Kumar at U.S. Bancorp Piper Jaffray Inc. in Menlo Park, Calif.

The ongoing volatility suggests that the technology sector meltdown that some analysts had been predicting is finally here, said David Wu, an analyst at ABN Amro Chicago Corp. in Mountain View, Calif.

Particularly hard-hit were several Internet stocks that have seen their valuations drop dramatically over the past few weeks. Examples include companies as varied as Santa Clara, Calif.-based Yahoo Inc. [Nasdaq:YHOO], Seattle-based Amazon.com Inc. [Nasdaq:AMZN] and Cambridge, Mass.-based Akamai Technologies Inc. [Nasdaq:AKAM], all of which were trading 50% below their valuations earlier this year. Old-line companies have also been hit. IBM fell 5 points to just over 106 following its earnings report last week, while Intel dropped more than 6 points to 122.

"It's anybody's guess when the meltdown will stop," Wu said. "All I know is I would want a bigger percentage of stock options if I were joining a dot-com company," he said.

Up and Down

Recent closing points of the Dow Jones industrial average and the Nasdaq composite index:

	DOW	NASDAQ
April 19	10,674.96	3,706.41
April 18	10,767.96	3,793.57
April 17	10,582.51	3,539.16
April 14	10,305.77	3,321.29

SOURCE: YAHOO INC

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SOFTWARE UP 4.4%						
ASWK	149.12	11.00	Active Software (H)	47.00	9.75	26.2
ADBE	125.00	26.43	Adobe Systems Inc.	108.44	3.44	3.3
ARBA	183.34	15.25	Ariba Inc.	65.63	-1.00	-1.5
AZPN	55.37	8.12	Aspen Technology Inc.	33.63	4.69	16.2
ADSK	56.06	17.00	Autodesk Inc.	37.31	-0.63	-1.6
AVID	25.56	9.43	Avid Technology	11.50	-1.25	-9.8
BMCS	86.62	30.00	BMC Software Inc.	41.88	0.44	1.1
BOBJ	150.87	8.18	Business Objects S.A.	90.75	11.75	14.9
CDN	26.62	9.18	Cadence Design Systems	15.69	0.88	5.9
CBTSY	60.87	8.56	CBT Group Plc.	39.75	5.50	16.1
CHKP	295.00	11.50	Checkpoint Software Tech. Ltd.	159.00	-2.00	-1.2
CTXS	122.31	13.25	Citrix Systems Inc.	54.38	3.81	6.6
COGN	82.25	19.37	Cognos Inc.	68.50	11.25	19.7
CA	79.43	32.87	Computer Associates Int'l Inc	51.31	-2.13	-4.0
CPWR	40.00	11.18	Compuware Corp. (L)	11.69	-0.56	-4.6
DCTM	106.00	9.37	Documentum	49.00	8.75	21.7
EFII	69.31	35.00	Electronics For Imaging	53.13	3.38	6.8
HNCS	130.00	13.75	Hnc Software	47.44	-7.06	-13.0
HYSL	65.00	9.87	Hyperion Software	23.31	-0.56	-2.4
IDXC	49.12	12.43	IDX Systems	16.88	-1.75	-9.4
INFA	110.87	8.00	Informatica Corp.	43.06	-8.56	-16.6
IFMX	21.25	6.03	Informix Software Inc.	12.38	-3.44	-21.7
INTU	90.00	22.50	Intuit	34.25	-0.75	-2.1
JKHY	40.56	13.21	Jack Henry Associates (H)	29.44	6.81	20.9
JDEC	48.31	10.87	J.D. Edwards & Co.	16.13	-1.31	-7.5
LGTO	82.50	10.50	Legato Systems Inc. (L)	18.00	-0.31	-1.9
MACR	100.00	27.37	Macromedia Inc.	57.63	-3.06	-5.6
MANU	70.25	5.25	Manugistics Group Inc.	33.50	3.25	10.7
MENT	18.50	7.75	Mentor Graphics	13.00	-0.25	-1.9
MSFT	119.93	73.00	Microsoft Corp. (L)	78.69	3.31	4.4
NETA	37.18	10.06	Network Associates	23.13	1.56	7.2
GMH	140.00	48.75	Network General	91.50	-8.00	-8.0
NOVL	44.56	16.06	Novell Inc.	20.63	-0.31	-1.5
ORCL	90.00	10.50	Oracle Corp.	71.00	3.38	5.0
PMTC	35.93	7.75	Parametric Technology Corp. (L)	8.31	0.91	9.8
PSFT	27.75	11.50	PeopleSoft Inc.	14.63	-1.13	-7.1
PIXR	50.62	33.00	Pixar	37.38	-1.25	-3.5
RATL	105.00	21.87	Rational Software Corp.	76.19	16.56	32.2
RHAT	151.31	7.00	Red Hat Inc.	26.06	0.06	0.2
QSFT	98.12	7.00	Quest Software	46.13	20.13	77.4
SAP	85.93	24.12	SAP AG	44.56	-2.81	-5.9
SCUR	29.62	2.25	Secure Computing Corp.	10.31	-0.81	-7.3
SDRC	23.43	8.81	Structural Dynamics Research	10.88	-0.06	-0.6
SYBS	31.00	6.40	Sybase Inc.	19.50	1.75	9.9
SYMC	81.62	10.50	Symantec Corp.	57.75	2.75	5.0
SNPS	75.62	36.87	Synopsis	40.63	0.13	0.3
SCTC	28.37	9.25	Systems & Computer Technology	22.19	5.19	30.5
BAANF	17.81	4.06	The Baan Co. N.V.	4.13	-0.38	-8.3
TIBX	147.90	5.00	Tibco Software Inc.	63.50	9.50	17.6
TSAI	48.17	20.25	Trans. Sys. Arch.	25.38	2.13	9.1
VRTS	174.00	13.55	Veritas Software Corp.	100.00	14.13	16.4
WIND	56.12	11.25	Wind River Systems Inc.	38.00	6.25	19.7
TELECOMMUNICATIONS CARRIERS UP 0.6%						
AT	91.81	55.87	Alltel Corp.	65.00	2.44	3.9
ANDW	34.25	11.18	Andrew Corp.	22.56	0.94	4.3
T	63.00	41.50	AT&T	50.00	-1.50	-2.9
BCE	137.50	44.06	BCE Inc.	103.63	4.56	4.6
BEL	69.50	47.37	Bell Atlantic	60.44	2.19	3.5
BLS	53.50	34.93	Bell South	50.44	1.19	2.4
BRW	41.06	16.31	Cincinnati Bell Inc.	28.56	-0.31	-1.1
CMCSK	57.68	28.90	Comcast	36.50	2.25	5.8
CQ	37.06	15.37	Comsat Corp.	21.44	1.25	6.2
COX	58.37	32.78	Cox Communications Inc.	42.00	-1.63	-3.7
GSTRF	53.75	7.87	Globalstar Telecom. Ltd. (L)	9.72	0.47	5.1
GTE	78.50	55.81	GTE Corp.	70.88	2.56	3.5
MCIC	165.87	33.00	Mastec Communications	112.13	4.38	4.1
SPOT	74.25	26.37	Panamsat	43.50	-4.00	-8.4
QCOM	200.00	15.37	Qualcomm	109.00	-8.63	-7.3
SBC	59.87	34.81	SBC Communications	41.56	3.31	7.4
FON	75.62	42.62	Sprint Corp.	58.94	1.44	2.5
TDS	137.00	55.43	Telephone and Data Systems	100.75	6.31	6.7
USW	81.50	51.50	US West	69.75	2.75	4.1
VIA	63.31	36.68	Viacom	51.25	1.13	2.2
WCII	66.50	24.00	Winstar Communications Inc.	37.25	3.25	9.6
WCOM	64.51	37.75	MCI Worldcom Inc. (L)	40.00	0.56	1.4
SERVICES UP 4.7%						
ACKM	35.93	14.56	Acxiom Corp.	28.00	1.88	7.2
ACS	53.00	31.00	Affiliated Computer Servs	36.38	1.44	4.1
AMSY	44.37	19.75	American Mgt. Systems	38.69	1.75	4.7
AUD	55.43	37.37	Automatic Data Processing	50.75	4.06	8.7
BSYS	69.00	41.37	Bisys Group Inc.	64.88	4.75	7.9
CATP	27.00	8.81	Cambridge Technology Ptnrs (L)	11.69	0.56	5.1
CEN	38.06	14.75	Ceridian	22.12	2.44	12.4
CBR	29.81	13.75	Ciber Inc.	17.94	1.06	6.3
CDO	57.25	15.81	Comdisco	31.13	-1.31	-4.0
CHRZ	27.12	9.25	Computer Horizons Corp.	12.25	0.25	2.1
CSC	94.93	52.37	Computer Sciences	80.00	3.94	5.2
DST	76.43	51.18	Dst Systems Inc.	71.69	7.63	11.9
EDS	76.68	46.87	Electronic Data Systems	70.31	9.25	15.1
FDC	54.25	38.87	First Data Group	49.50	8.69	21.3
FISV	40.75	24.12	Fisery	37.59	2.16	6.1
IT	24.93	9.56	Gartner Group	13.00	0.87	7.2
KEA	35.00	17.25	Keane	22.13	1.75	8.6
NDC	52.06	21.75	National Data	27.38	1.50	5.8
PAYX	55.18	23.56	Paychex Inc. (H)	51.44	3.13	5.7
PER	33.62	15.31	Perot Systems Corp.	16.44	-0.50	-3.0
REGI	9.75	2.68	Renaissance Worldwide	3.94	0.56	16.7
REY	33.00	17.75	Reynolds & Reynolds	26.56	0.81	3.2
SFE	99.00	15.85	Safeguard Scientifics	36.00	1.69	4.5
SAPE	151.18	23.87	Sapient Corp.	65.13	1.25	2.0
SMS	73.50	35.50	Shared Medical Systems	48.38	0.25	0.5
SDS	40.00	16.87	Sungard Data Systems	33.13	-0.06	-0.2
SYNT	20.93	7.00	Syntel Inc.	10.50	0.13	1.2
TECD	44.68	18.00	Tech Data	40.13	6.50	19.3
TENF	76.87	17.00	TenFold Corp.	26.00	-8.63	-24.9
TSS	20.87	14.12	Total System Services Inc.	18.69	1.50	8.7
TSAI	48.12	20.25	Transaction Sys. Architects	25.38	2.13	9.1
NETWORK UP 3.1%						
COMS	119.75	20.00	3Com Corp.	39.50	-2.88	-6.9
ADCT	58.93	17.18	ADC Telecommunications Inc.	32.31	2.91	5.9
ANTC	61.25	19.00	Antec	42.75	5.75	15.5
BNYN	40.56	6.25	Banyan Systems Inc.	14.00	2.81	25.1
CS	52.75	7.18	Cabletron Systems	20.06	-1.75	-8.0
CNEBF	8.93	2.87	Call-Net Enterprises	3.88	-0.50	-11.4
CSCO	82.00	24.81	Cisco Systems Inc.	69.13	5.31	8.9
ECIL	41.75	23.75	ECI Telecom	24.94	-0.56	-2.2
ENTU	150.00	16.87	Entrust Technologies Inc.	40.63	-13.63	-25.1
HRS	40.62	15.50	Harris Corp.	28.31	0.63	2.3
GMH	140.00	48.75	Hughes Electronics/GM	91.50	-8.00	-8.0
ERICY	105.25	23.75	LM Ericsson	78.00	2.44	3.2
JNPR	212.93	11.33	Juniper Networks Inc.	160.44	8.19	3.8
LU	84.18	49.81	Lucent Technologies	61.81	7.31	13.4
MADGF	17.37	1.43	Madge Networks	5.94	1.56	35.7
NCDI	9.62	1.56	Network Computing Dev (L)	2.00	-1.06	-34.7
NWK	14.81	7.31	Network Equipment Tech.	8.63	-0.81	-8.6
NN	28.50	14.00	Newbridge Networks	33.63	2.13	6.7
NOK	58.34	16.92	Nokia Corp.	49.19	2.56	5.5
NT	144.18	30.71	Northern Telecom Ltd.	100.56	5.31	5.6
PAIR	21.37	8.00	Paragon Technologies Inc. (H)	21.00	1.13	5.7
PCTL	15.31	2.75	Picturetel (L)	3.50	2.00	36.4
SFA	77.00	12.75	Scientific Atlanta	60.94	9.00	17.3
TLAB	77.25	41.81	Tellabs Inc. (L)	46.37	1.00	2.1
USW	81.50	51.50	US West	69.75	2.75	4.1
VRLK	72.00	1.81	Verilink	10.00	3.50	53.8
WSTL	40.75	3.87	Westell Technology Inc.	23.00	3.19	16.1
SEMICONDUCTORS, CHIPS & EQUIPMENT UP 6.6%						
ADPT	63.56	19.75	Adaptec	31.69	0.88	2.8
AMD	79.25	14.56	Advanced Micro Devices (H)	78.75	7.06	10.1
ALTR	99.25	30.00	Altera	90.44	11.44	14.5
ADI	94.68	15.25	Analog Devices	63.06	4.56	7.8
AMAT	115.00	24.21	Applied Materials	91.88	5.81	6.8
ASML	150.75	32.75	ASM Lithography Holding (L)	36.94	4.10	12.5
FCS	44.93	16.50	Fairchild Semiconductor Corp.	37.13	1.50	4.2
HRS	40.62	15.50	Harris Corp.	28.31	0.63	2.3
INTC	165.37	50.12	Intel Corp.	115.63	2.38	2.0
KLAC	97.75	21.18	Kla Instruments	62.94	1.94	3.2
LLTC	62.50	24.25	Linear Technology	47.44	3.63	8.3
LSI	90.37	15.18	LSI Logic	54.88	4.19	8.1
MXIM	74.50	24.50	Maxim Integrated Products	56.56	4.44	8.2
MU	143.12	34.25	Micron Technology	121.25	20.13	19.9
MOT	184.62	72.62	Motorola	109.88	3.69	3.2
NSM	85.93	8.87	National Semiconductor	55.75	2.75	5.2
STM	231.62	49.00	SGS-Thomson Microelectronics	167.94	28.88	18.7
SLR	49.50	22.56	Solectron Corp.	45.69	6.63	17.0
TER	102.00	21.84	Teradyne (H)	94.31	14.75	18.5
TXN	199.56	49.50	Texas Instruments	148.13	7.38	5.3
UMCSU	153.42	12.81	Umghase	84.13	2.75	3.2
VTSS	119.68	20.37	Vitesse Semiconductor Corp.	57.75	2.22	3.7
XLNX	89.43	19.50	Xilinx	65.69	1.13	1.7
COMPUTER SYSTEMS UP 5.5%						
AAPL	150.37	33.50	Apple Computer Inc.	118.34	2.97	2.6
ASPX	19.00	3.87	Auspex Systems	6.41	0.22	3.5
BEOS	39.56	3.28	Be Inc.	8.25	-1.75	-17.5
CPQ	34.00	18.25	Compaq	27.19	1.69	6.6
DELL	59.68	31.37	Dell Computer Corp.	49.75	-0.25	-0.5
GTW	84.00	28.37	Gateway 2000 Inc.	54.75	0.00	0.0
HWP	155.50	85.12	Hewlett Packard Co.	138.25	7.88	5.7
HIT	164.50	67.00	Hitachi Ltd.	121.81	4.81	4.1
IBM	179.18	81.50	IBM	103.00	6.44	-5.9
MUE1	20.68	9.00	Micron	11.19	-0.13	-1.1
MOT	184.62	72.62	Motorola	109.88	3.69	3.2
NATI	59.50	17.93	National Instruments Corp.	49.94	3.38	7.2
NCR	54.56	26.68	NCR	39.81	1.06	2.7
NIPNY	149.50	52.12	NEC	133.75	0.25	0.2
PROM	89.75	3.43	Procom Tech Inc.	27.94	7.19	34.6
SGI	18.87	6.87	Silicon Graphics Inc.	7.94	0.06	0.8
SNE	314.75	89.25	Sony	239.25	4.88	2.0
SUNW	106.75	24.90	Sun Microsystems	86.19	5.06	6.2
TRCD	22.75	1.53	Tricord Systems	10.56	3.94	59.4
UIS	49.68	19.50	Unisys (L)	23.50	1.88	8.7
INTERNET UP 1.8%						
AMZN	113.00	40.81	Amazon.com (L)	51.90	5.06	10.9
AOL	95.81	38.46	America Online	60.44	4.25	7.6
ATHM	99.00	17.75	Athome Corp. (L)	17.75	4.38	19.8
CKFR	125.62	23.12	Checkfree	33.81	2.56	7.0
CYCH	24.00	6.56	Cybercash Inc. (L)	8.38	0.75	9.8
EBAY	255.00	70.25	eBay Inc.	147.06	4.19	2.9
ETYG	86.00	4.50	eToys Inc. (L)	6.06	0.88	16.9
EGRP	72.25	16.06	ETrade Group Inc. (L)	19.81	1.19	5.7
LCOS	93.62	28.56	Lycos Inc.	36.34	5.53	13.2
QMKT	65.50	9.87	Open Market Inc. (L)	10.56	2.06	16.3
QTEX	60.62	9.50	Open Text Corp.	24.38	2.25	10.2
PCLN	165.00	45.50	Priceline.com Inc.	65.00	9.25	16.6
PRGY	41.25	8.25	Prodigy Communications (L)	11.50	1.44	14.3
PSIX	60.93	15.53	PSINet Inc.	23.94	0.19	0.8
RSAS	93.06	14.25	Security Dynamics	50.13	4.88	10.8
SPYG	95.25	8.62	Spyglass Inc.	39.50	5.13	14.9
WINK	75.00	6.00	Wink Communications Inc.	18.38	-3.13	-14.5
YHOO	250.06	55.00	Yahoo Inc.	122.06	6.69	5.2
STORAGE & PERIPHERALS UP 5.6%						
ADPT	63.56	19.75	Adaptec Inc.	31.69	0.88	2.8
APCC	44.87	13.18	American Power Conversion	39.75	2.81	7.6
CANNY	46.75	23.00	Canon Inc.	43.00	4.13	10.6
DBD	30.68	19.68	Diebold Inc.	29.00	0.81	2.7
EK	79.81	53.31	Eastman Kodak Co.	58.44	-3.56	-5.7
EMC	145.43	46.93	EMC	129.75	15.25	13.3
IOM	6.37	2.87	Iomega	3.63	0.38	9.4
MXTR	14.81	4.25	Maxtor Corp.	10.56	0.25	2.4
NTAP	124.00	9.84	Network Appliance Inc.	57.63	4.25	8.0
LXK	135.87	49.50	Lexmark International Group Inc.	111.31	10.69	10.6
SEG	75.43	25.12	Seagate Technology	47.13	6.75	16.7
SSYS	29.37	11.37	Storage Technology (L)	12.25	0.13	1.0
TEK	71.75	22.12	Tektronix	59.81	9.00	17.7
XRX	83.93	19.00	Xerox	24.81	0.06	0.3

KEY: **(H)** = New annual high reached in period
(L) = New annual low reached in period

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Accessibility Law Evokes Cheers, Fears

IT must meet new standards by Aug. 7

BY SAMI LAIS
WASHINGTON

SECTION 508, a technology-related amendment to the Americans With Disabilities Act (ADA), is scheduled to take effect Aug. 7. The amendment is being both hailed as a milestone and criticized as premature.

The law will help prevent job discrimination against people with disabilities, said Attorney General Janet Reno at last week's FOSE trade show and government user conference. "Some employees with disabilities lost jobs or became underemployed due to technological advances," Reno charged in a report to the president on the issue.

According to the 1994 U.S. Census, 49 million Americans have a disability, 24 million require assistive devices such as wheelchairs, and only about a quarter of people with disabilities have jobs.

Guidelines for 508 call for use of standard application programming interfaces for assistive technology. But compliance can be as simple as providing a keyboard option for a mouse click, such as typing "Control-P" instead of using a mouse to select the print option from a menu, Reno said.

Waivers are available for some applications, such as fighter planes or weapons systems, or if compliance would call for fundamental changes in the device or software, Wakefield said.

It's not the law but its timing that is at issue, said Harris Miller, president of the Information Technology Association of America industry group in Arlington, Va. Standards for product compliance won't be ready by Aug. 7, therefore no products can be in compliance by then, Miller said.

The group charged with defining the standards, the U.S. Architectural and Transportation Barriers Compliance Board (the Access Board), recommended that the law take effect not on Aug. 7, but six months later, said David M. Capozzi, a director of the board's Technical and Information Services. The ITAA plans to petition Congress for a similar extension.

The law doesn't require vendors to embed more costly, assistive technology such as braille displays or screen readers, said Douglas Wakefield, IT accessibility specialist at the Access Board.

It's preferable that they don't add such technology, Wakefield said. Use of standard application programming interfaces in software, for example, would let a user choose any screen reader and it would work with that software, he said.

For five years, the U.S. Department of Education has been working in its testing lab with information technology vendors such as Compaq Computer Corp., Microsoft Corp. and Oracle Corp. to develop many of the requirements and language in Section 508, said Craig Luigart, the department's CIO.

Section 508 covers only the federal government, but its requirements likely will be reflected in the private sector within five years, Luigart said, driven not by the disabled but by aging baby boomers.

Bernard B. LaFleur, president and CEO of kiosk vendor Quad Media in Radford, Va., scoffed at timing objections. The ADA details many of the standards, as do proposed guidelines for the 508 amendment, LaFleur said. Technology to make IT accessible "is not new," he said.

JUST THE FACTS

Equal Accessibility

Section 508 report recommends:

- Increase coordination of federal technology accessibility efforts
- Create a technology accessibility hotline
- Offer a technical support center
- Establish accessible products and training clearinghouse
- Provide an Internet message board to post best practices

Continued from page 1

Privacy

Aftab & Savitt PC, which specializes in Internet laws concerning children. "They think they are, but they aren't."

Part of the problem, said Aftab, is that many general-interest Web sites that have a section for children or run a special kids' event, such as a contest, don't realize that they must comply with COPPA.

And compliance can be difficult and costly.

Alison Pohn, managing director at The FreeZone Network in Chicago, said her company spent $96,000 making its site compliant with the act (see related story at right). She recommends hiring a lawyer to determine what level of consent is required and what must be included in the privacy statement.

The act requires that any site with knowledge that children under the age of 13 are visiting and sharing personally identifiable information — whether it's required for registration at the site or might be revealed in a chat room or posting service — must gain prior parental consent. The consent requirement ranges from e-mail notification for sites that don't share information to off-line verification — via fax or telephone — for sites that share personally identifiable information or allow children the opportunity to do so, such as in a chat room.

Most major children's sites, such as Atlanta-based Cartoon Network Inc. and New York-based Nick.com, have worked diligently to meet COPPA's requirements, according to Loren Thompson, an attorney at the Federal Trade Commission.

"I think it behooves a lot of businesses to do these things anyway," she said.

For some sites, complying with COPPA went down to the wire.

At the Web site of former Beanie Baby maker Ty Inc., for example, kids can register to participate in online chats. But the day before the deadline, the company's privacy statement didn't list the required contact information. COPPA mandates that kids ' sites list contact information such as address, telephone number and e-mail so parents can easily reach the company.

John Hong, Internet coordinator at Ty, said the company has been working on COPPA for some time and that he expected the site to be "100% compliant" by the FTC deadline. On Friday, the company's privacy policy had been updated to meet COPPA requirements.

COPPA "may shake up the industry," said Allison Ellis, vice president of programming and content at Los Angeles-based FoxKids.com Inc., which brought its site into compliance the day before the deadline. "There are places that simply collect information and thumb their noses at the FTC."

The FTC will be pursuing several cases in the coming months and searching for non-compliant sites, Thompson warned.

Sites that don't meet COPPA requirements could face fines of $11,000 per violation.

Protecting Kids' Privacy Is Costly

Most Web site operators agree that protecting kids' privacy online is a worthy endeavor. But complying with the Children's Online Privacy Protection Act (COPPA) can carry a high price tag.

FreeZone Network, for instance, estimates it spent $96,000 to make its site compliant with the act, according to Alison Pohn, the Chicago-based company's managing director.

"We're welcoming COPPA," said Pohn, "particularly to educate parents and kids about what's happening on the Web."

The FreeZone site, geared toward children ages 8 to 14, has 600,000 registered users. When a child under 13 registers at the site, the birth date will kick the user to a parental consent form that must be faxed to the company, Pohn said.

The company estimates it spent the following:

- $53,130 on safety content, data entry, legal advice and background checks for staffers.
- $28,980 on database management, online forms, incoming faxes, mailing costs and handling, and storing parental permission slips.
- $14,490 on equipment, space and utilities needed to carry out staff functions.

Other companies have taken a different tack.

"Our way to be compliant is to just not allow kids 12 and under on the site," said Karen DeMars, president of eCrush.com, a San Francisco-based site devoted to kids talking about their teen-age crushes. "We just didn't have the manpower to verify all the parental consents, and there's just no faking that."

Eliminating children under 13 from the site cut eCrush's audience of 350,000 users by about 5%, she said. The additional staffing and programming needed to comply, however, would have cost an additional $50,000 – too big a price tag given that the site runs at an annual cost of about $1 per user, DeMars said.

– *DeWayne Lehman*

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FRANK HAYES/FRANKLY SPEAKING

HR ain't that bad

HOO BOY! Last week I suggested — among other things — cutting the human resources department out of the IT-shop hiring loop. I might as well have wired every copy of *Computerworld* straight to wall current. What a hot button — I got mail from IT-shop veterans and students, career changers and consultants who'd prefer a steady gig, all of them snarling for the heads of the people in HR. Not a single programmer, network administrator or operations guy had a nice word to say about the gatekeepers who make it so hard to get an interview.

But I was wrong.

Just taking HR out of the process won't solve the problem. For one thing — as several recruiters, HR people and hiring managers wrote to tell me — HR doesn't dream up those loony 10-years-of-XML-experience requirements. Hiring managers and department heads do that. For another, good HR people actually work hard to get the right requirements specified and the right résumés in front of the hiring manager.

And anyhow, hiring is such a complicated legal morass these days that no big company can afford to do without HR specialists.

So how can IT job applicants get past those HR gatekeepers? Maybe by doing some things that actually make the whole process smoother and more successful for everybody.

Do the research. Find out what's in demand. Check out Web sites with current job-market information, like *www.computerworld.com/careers* or *www.rileyguide.com*. Research the right buzzwords for your résumé. If you want to work in a particular industry, pick likely employers and dig deeper to find out what they need. Sure, they all want experience — but doing what?

Target your résumé. Don't waste HR's time or anyone else's. Work over that résumé like it's critical code. Make your résumé clear and easy to read — in every sense. If it's electronic, make sure it's in plain text, not some word-processor format. If it's on paper, forget the fancy fonts — you want those automated scanners to recognize the buzzwords you researched.

Talk to friends. If you don't have friends in IT shops, make new friends. Most companies — around 90% — like to hire people their own employees referred. Most managers will feel a lot more comfortable about you if Mary the programmer or Al the system administrator says you're OK.

Ask around. If you can't get an employee referral, you can still schmooze at user-group meetings. Ask your brother-in-law. Ask your next-door neighbor. Pick up the phone, call potential employers and ask if they're hiring, what they're looking for and how to pitch your résumé. Call your college's placement department — they'll be asking for alumni donations for the rest of your life, so you might as well ask back.

Just taking HR out of the process won't solve the problem.

Toot your horn. If you're a Java specialist, say so up front. If you've been managing Oracle databases for years, make it known. If you're a business-process expert, tell them. Don't make anyone guess what you're good at. And don't make yourself sound like a generic IT grunt. Nobody's filling a generic job.

Know your price. And be realistic — it'll be set by supply and demand, not your skills and experience. In-demand specialists make big bucks because they're hard to come by. If experienced IT people make more, it's because they got smarter, craftier and more productive, not just older. Generic programmers and operations workers are cheap. That's cold, hard and ugly — but it's true.

Sell yourself. You say you're not a salesman? You are now. Chase leads, track prospects, make cold calls, follow up — and you'll have a much better shot at getting past those HR gatekeepers. ◗

Hayes, Computerworld's staff columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

A NERVOUS SENIOR IT manager whispers to this software-guru pilot fish, "What's it take to spoof an e-mail?" Seems someone got a phony message apparently (but not really) from the CEO. The fish runs down the list: cracking the password file, a systems administrator gone bad, someone sneaking into the CEO's office while he's at lunch. Then he tries something simpler: At a test workstation he logs on as the CEO, using the CEO's user ID as the password. "Turns out we didn't need any sophisticated or underhanded method to spoof the CEO," says the fish, "just his name." Postscript: Repeating the story to a co-worker a month later, the fish tries it again – and it still works.

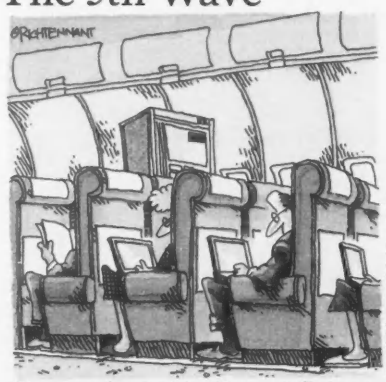
PILOT FISH'S TEAM is tasked with testing a diagnostic tool that took another five-programmer team a year to develop. The sample test cases work fine, but the fish's team can't get the tool to diagnose real-world problems. Friday at 3, the fish's boss sets up a Monday meeting with the head of the tool's development team so she can explain how to use it. Monday, 9 a.m., she no-shows. At 10 a.m., the fish finds out why: The missing manager resigned on Friday at 4:30.

NEW LAPTOPS for a state court system's judges come with Windows 2000 preinstalled. But the pilot fish prepping the PCs discovers the default configuration won't work properly on the network. "Will we get the Win 2k CDs to reconfigure them?" asks a fish. No, says the boss. "What happens if we need the CDs to install software?" the fish presses. Boss, with a straight face: "Try to work around it."

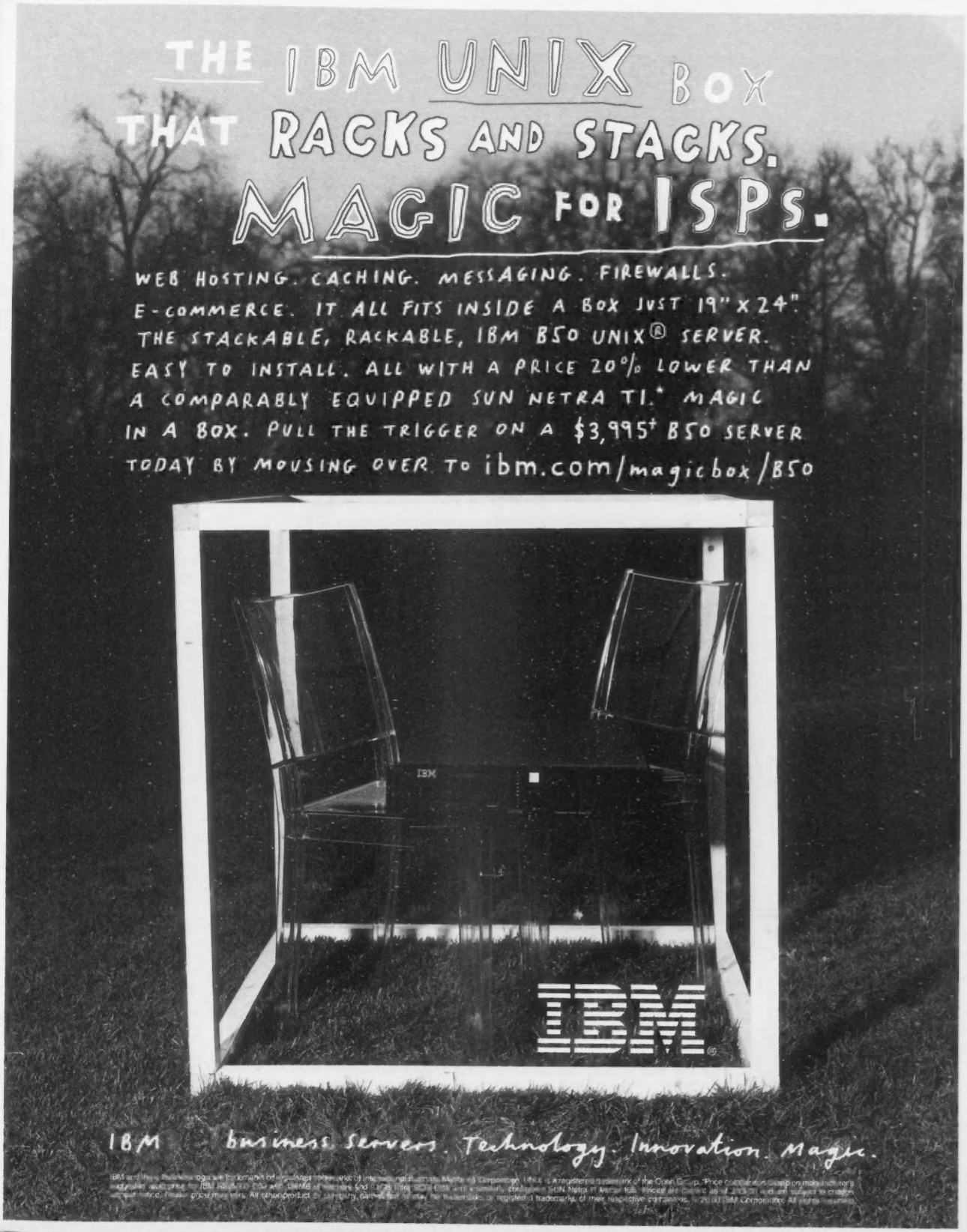
SOME LONELY BRAIN CELLS OUT THERE Last Monday, a pilot fish starts getting messages that obviously contain macro viruses. (You know the ones: "Important Message From" subject line, and the Word file inside remails itself 20 times.) IT quickly warns everyone to delete the suspect messages, but the mail server still crashes. Finally, all's calm. Back to work, right? Nope. "I get the same mail message again, from the same user who started it all," says the fish. "She opened the file *again*."

What comes after 12? Sharky hears the next release of Sybase's Adaptive Server won't be 13; that might be, um, unlucky. And 14 is no good because in some Asian cultures that's also supposedly bad news. The current plan is to dub it 15 – unless a higher bid comes in. Make your bid to score a Shark T-shirt: **sharky@computerworld.com**. And take the daily dive at *computerworld.com/sharky*.

The 5th Wave



"In preparation for takeoff, we ask that you turn off all electronic devices, laptop computers and mainframes..."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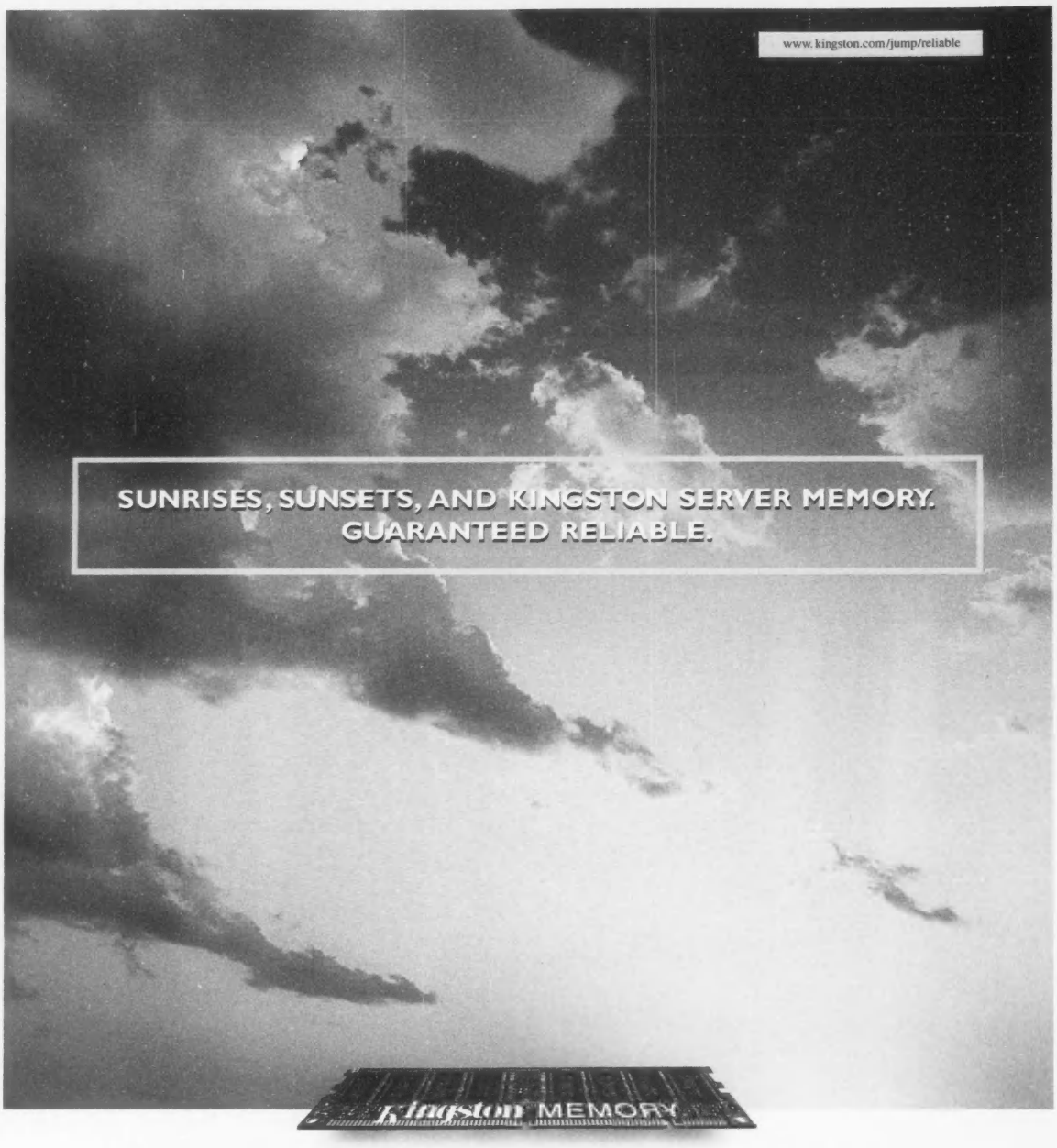

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